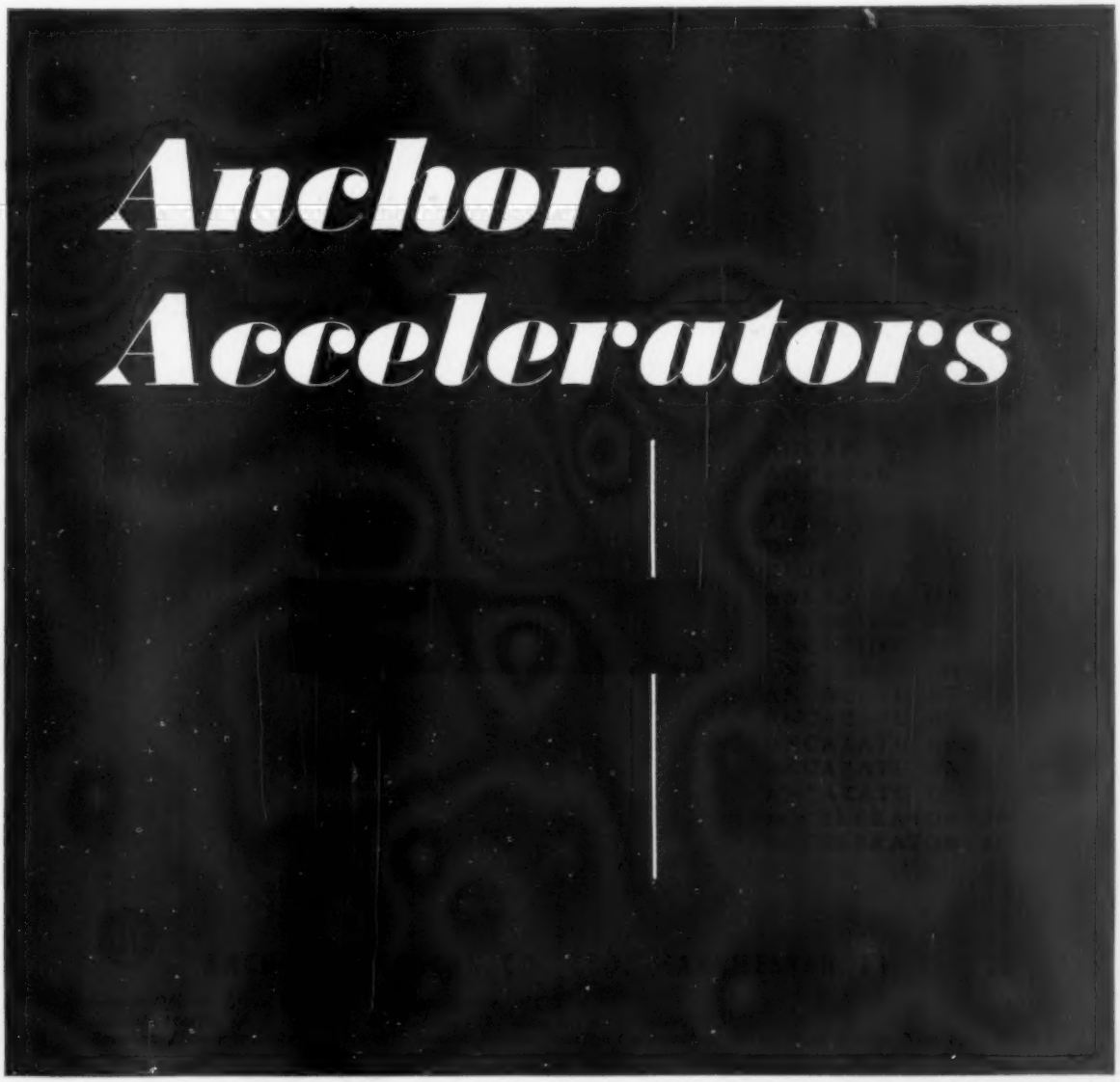
Rubber Journal and International Plastics

VOL. 139 NO. 21 NOVEMBER 19 1960 Price 1s. Weekly



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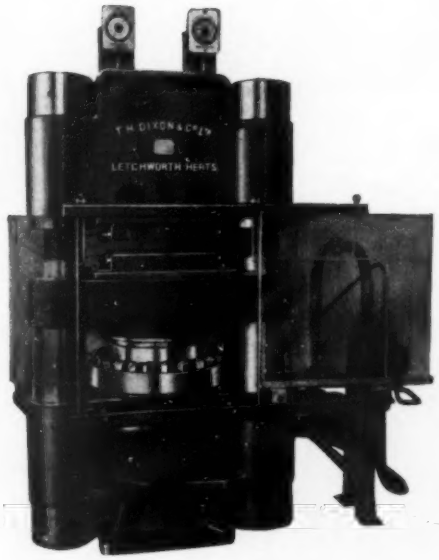

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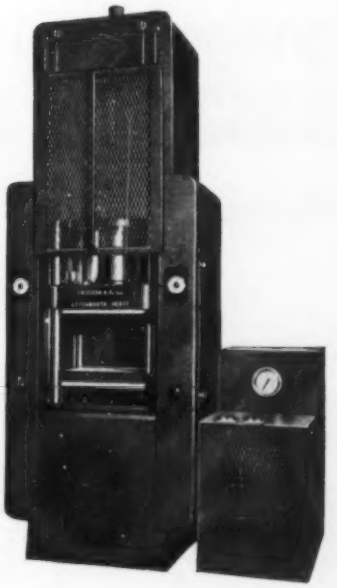

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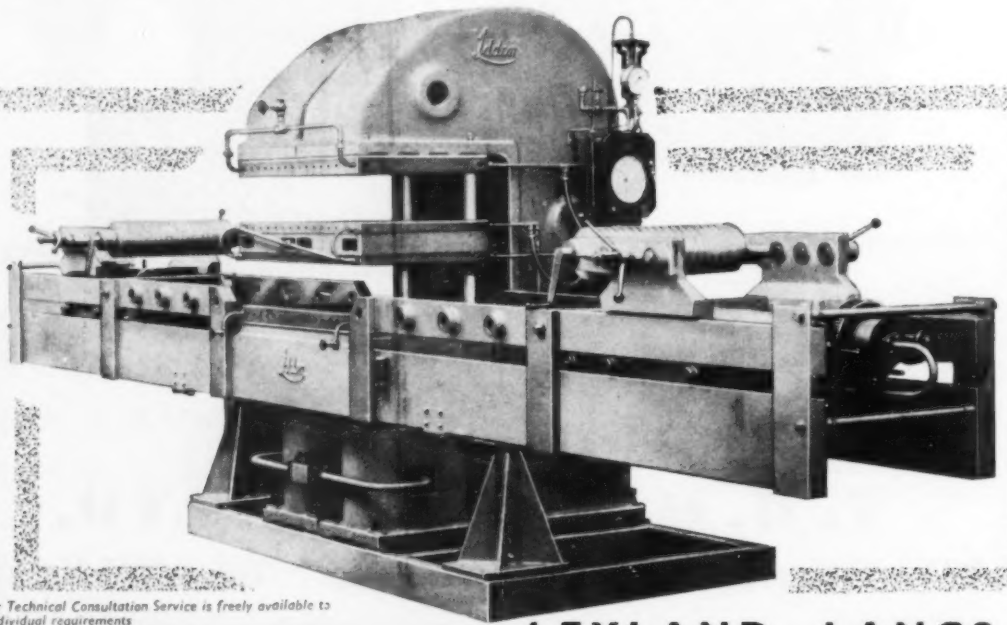

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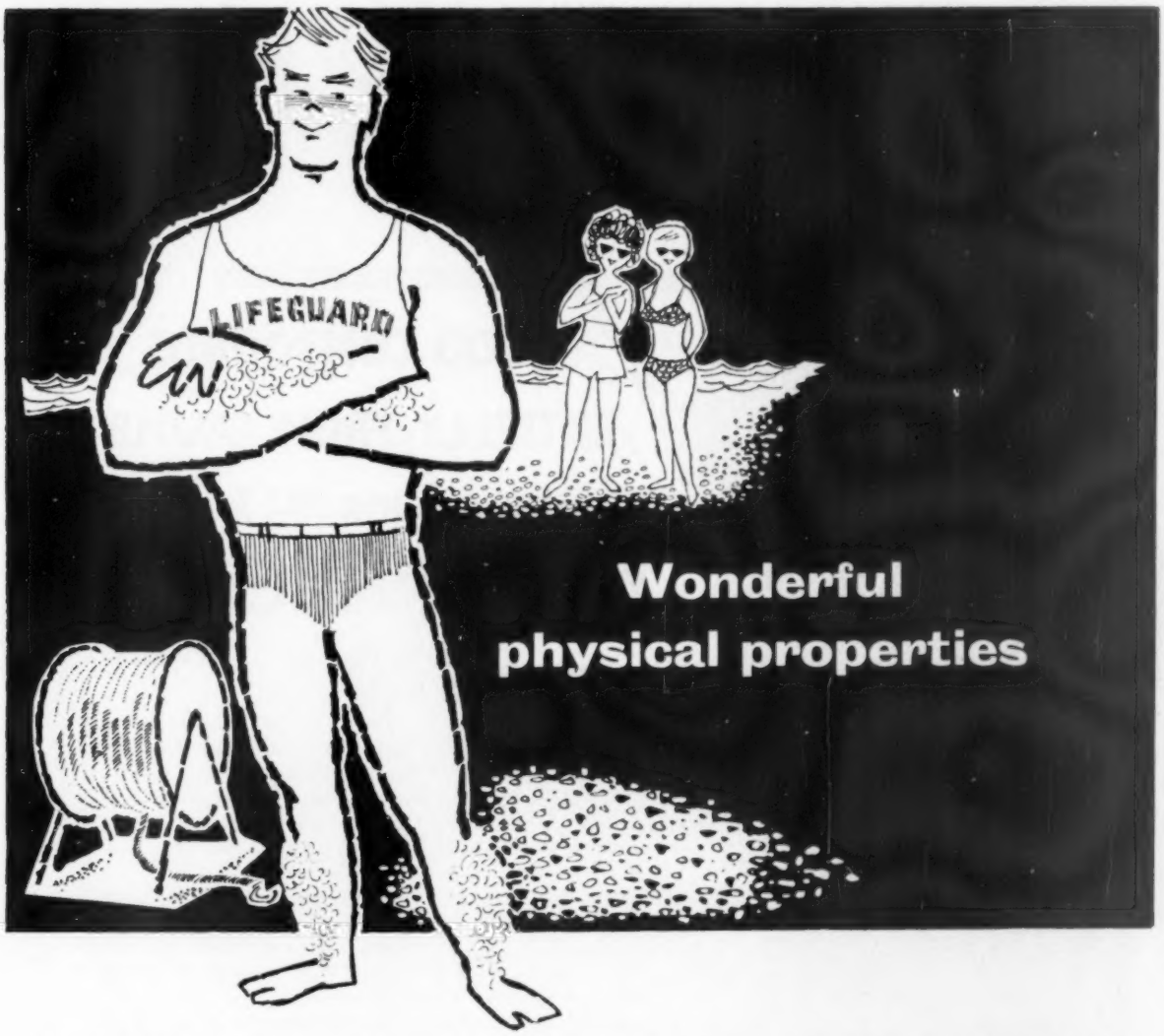

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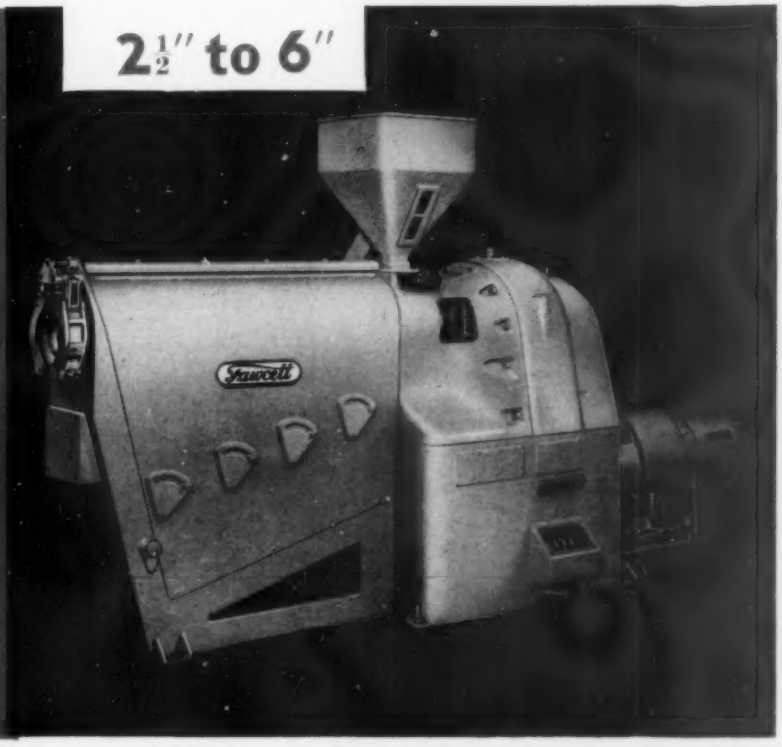

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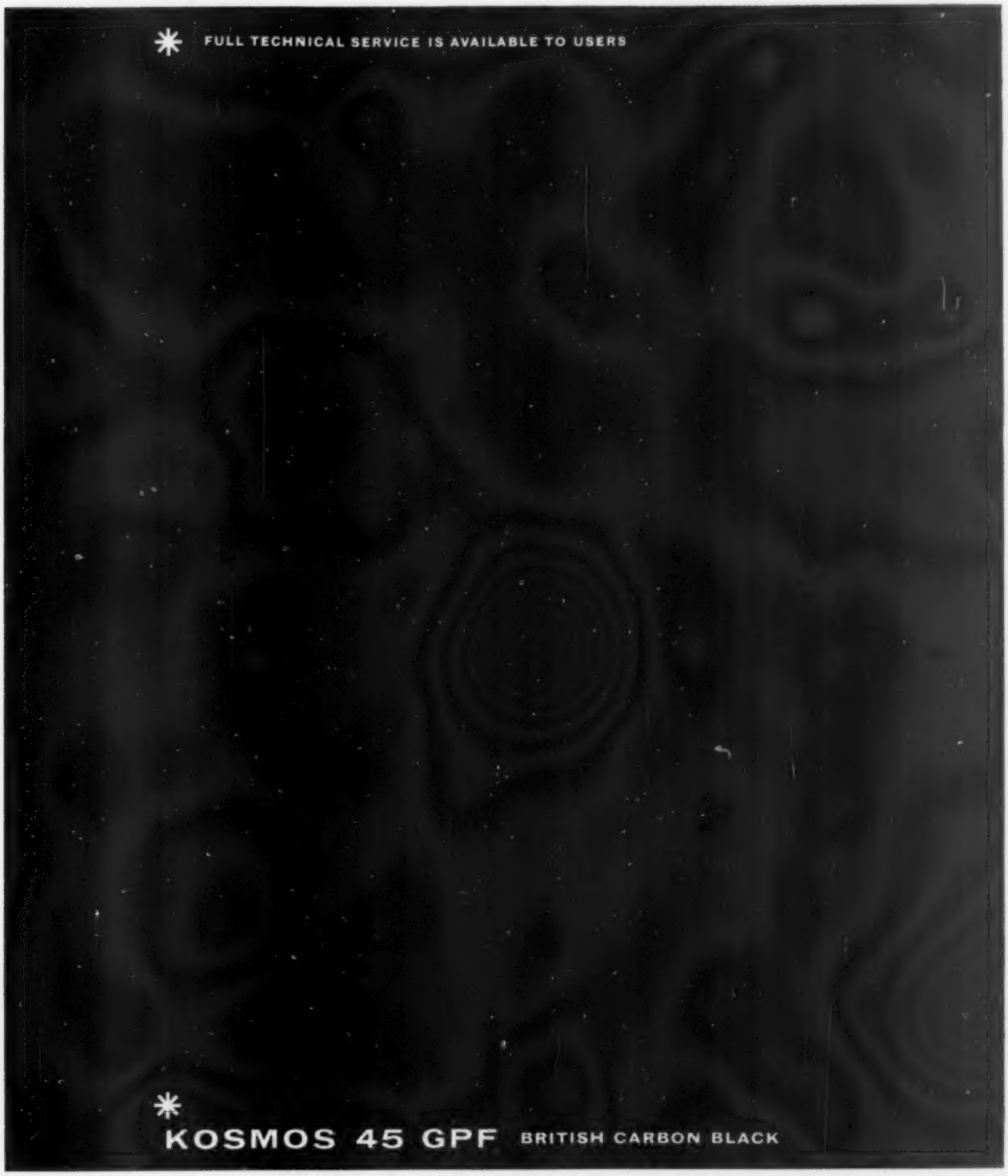

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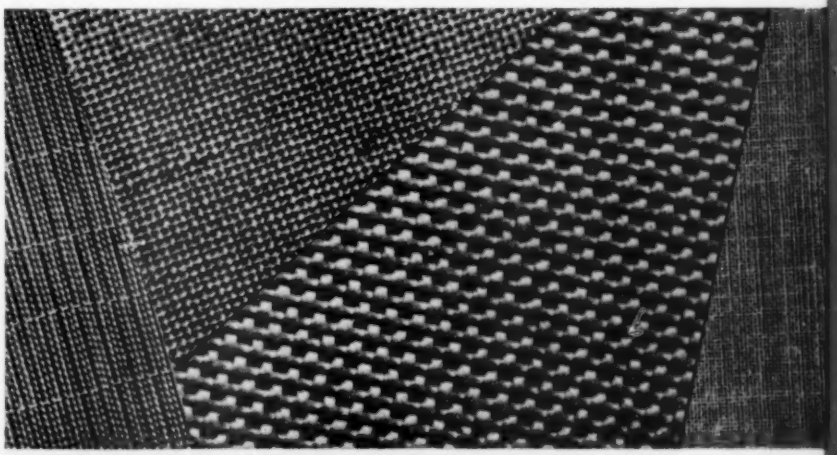

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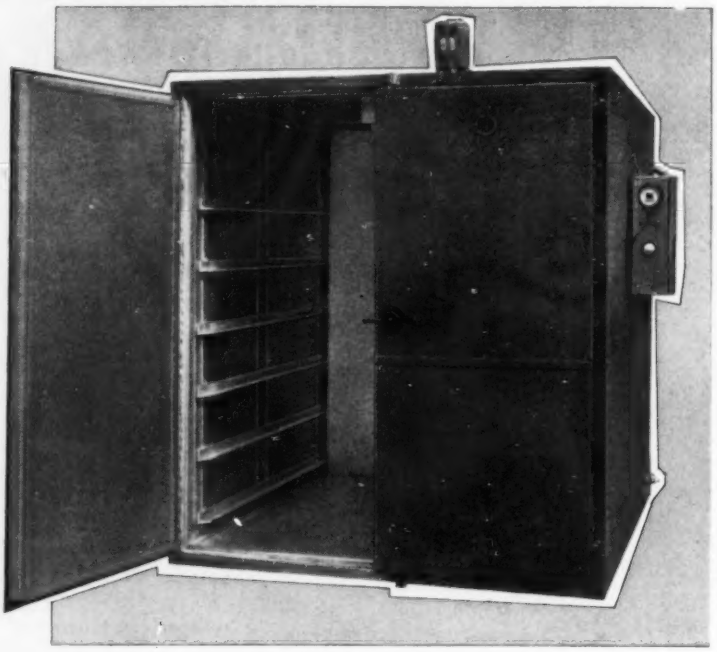

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Rubber Journal and International Plastics

Volume 139 **Price 1s. Post free 1s. 4d.** **No. 21**

IN ITS 77th YEAR

November 19 1960

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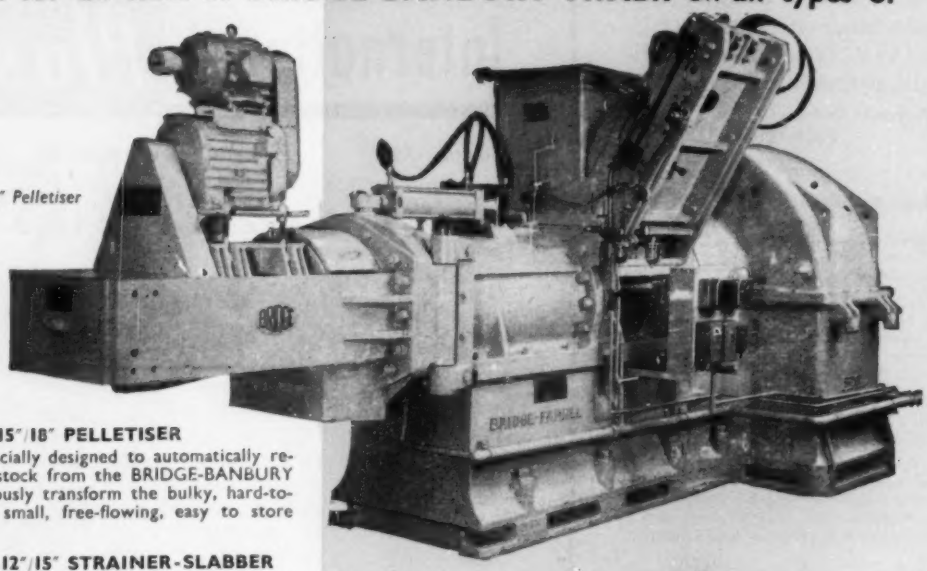

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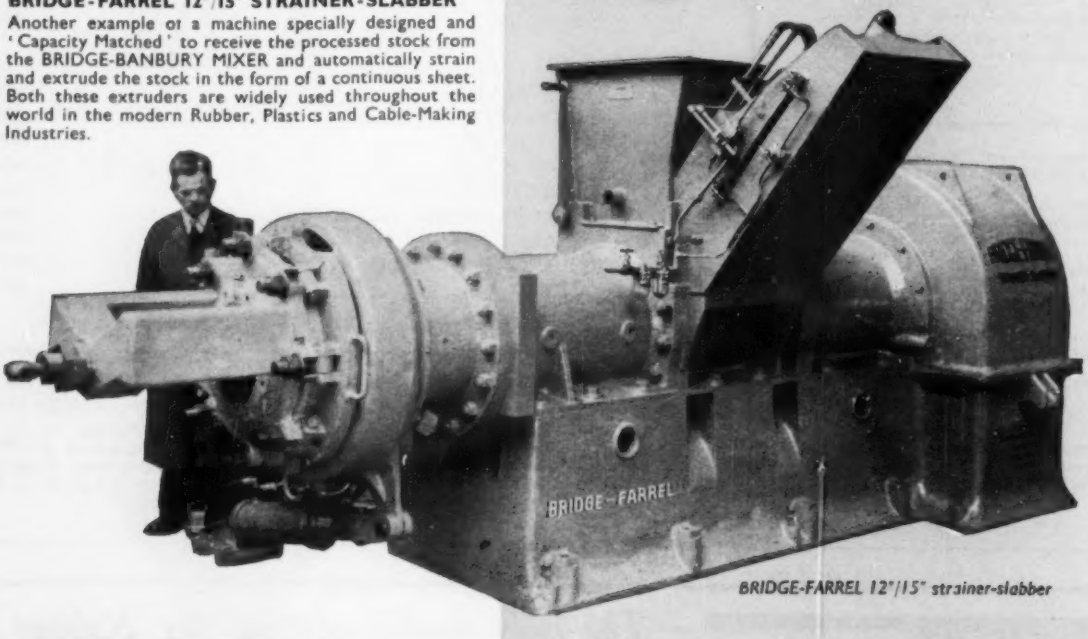

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NOTES of the WEEK

Research Link

A DECISION that must profoundly and beneficially affect our industries was taken on Tuesday last when, at an extraordinary general meeting of RABRM, the articles of a new combined rubber and plastics research association were adopted. The result is that the Research Association of British Rubber Manufacturers will be known from January 1 1961 as the Rubber and Plastics Research Association of Great Britain. Research will be done at the testing laboratories of RABRM at Shawbury, Shropshire, where work on an extensive plan of new buildings has already begun. Plastic manufacturers who are founder members—some 70 member firms of the British Plastics Federation have already joined—are to be represented in the association by a Plastics Research Committee and by representatives on the council.

The decision reflects many months of work behind the scenes by Mr David Radford, BPF chairman, Dr W. F. Watson, director of research, RABRM, and an exploratory committee of the Federation. In fact, unofficial talks between a few members of the British Plastics Federation and representatives of RABRM first took place more than four years ago. In 1958, the BPF set up a fact-finding committee with instructions to report. After consultation with the DSIR and inspection of the facilities at Shawbury, the sub-committee's recommendations were accepted by the executive committee of the BPF. Then in April last year the sub-committee was reappointed to study practical plans for a joint research association.

Mutual Benefit

THE move, as Mr Radford commented, is obviously going to be of mutual benefit to the two industries, both economically and scientifically. This is obviously true. As a research organization, RABRM has gained for itself a world-wide name and figures in the top rank of such organizations regardless of the type of work undertaken. Over recent years, research at Shawbury has spread increasingly, and inevitably, into the plastics field. The advent of many different kinds of synthetic rubbers and movement of rubber companies into plastics manufacture made this further expansion of activities—for work on rubber is itself increasing—inevitable.

Mr P. W. Howard, president of RABRM, pointed out at Tuesday's meeting that there had been a number of milestones during the 41 years' life of RABRM. The new name and extended field of work represented still another. It was, he stressed, no marriage of convenience. What they had decided represented a 'coming together of two great and growing industries in a common purpose in which they are both vitally concerned'. That common purpose is research in its broadest sense, without which neither industry can expect to continue to develop and expand.

Although only a comparatively small, but nonetheless representative, section of the plastics industry are pioneers of the new association, the entire industry stands to benefit. It is to be hoped that many more companies in the industry will come forward to join the founder members. Few nowadays doubt that research is absolutely essential but it must be paid for.

Roadworthy Rubber

RUBBER can do a lot for roads. Research and experience over many years and in many countries has left no doubt that rubberized road surfaces give superior performance even in the most exacting conditions. There are, for instance, rubberized roads in Canada, on the trans-continental highway where temperatures can be extreme in both directions, and in Queensland where it becomes pretty warm. There are a few stretches in this country; the Birmingham ring road flyover and Porlock Hill are examples. It is all the more regrettable, therefore, that so far, in the few miles of motorways available, no use has been made of rubberized surfaces. It might well be pointed out to the Minister of Transport that he rides on rubber; probably sits and walks on rubber; perhaps even sleeps on rubber. Almost certainly his pants, and maybe his trousers, are kept up by rubber. If he makes any mistakes—apart from that of not using rubber in roads—he may well erase them with rubber. Perhaps, like so many of us, he takes rubber for granted. It is all to the good, therefore, that the theme of the Natural Rubber Bureau's exhibit at the Public Works and Municipal Services Exhibition held in London this week was 'Rubber in Roads and Public Works'. It would be fine if Mr Marples were able to say when he opens new motorways: 'Thar's rubber in them thar roads'.

NEWS *Briefs*

SBR MOVES IN ARGENTINA—NYLON PLANT ON STREAM—BLACK PROJECT—SWEDISH PLASTICS PLANT—CAPROLACTAM TIE-UP—ORANGE DIENES

●**Argentina** — Two American firms have announced plans to manufacture rubber chemicals in Argentina. B. F. Goodrich Chemical Co. and R. T. Vanderbilt Co. will work with Anator SM in manufacturing accelerators, anti-oxidants and other chemicals. Production facilities, to be located in the vicinity of Buenos Aires, will be capable of handling current Argentine requirements for such chemicals and of meeting projected needs, including the requirements of a new synthetic rubber plant planned for that country.

●**United States**—Production of nylon filament for use in tyre cord is now under way at the Firestone Synthetic Fibers Co.'s Hopewell plant. Firestone is the first American rubber concern to produce its own nylon filament. Both monofilament and multifilament yarns are being made and capacity is 10m. lb. The plant employs about 300.

●**Canada** — Columbian Carbon's Canadian carbon black plant is now under construction at Hamilton, Ontario. The plant, designed for an annual capacity of approximately 40m. lb. of various grades, is expected to be completed during the second quarter of 1961 at a cost in excess of $5m.

●**United States** — The new polymer plant at Orange, Texas, now scheduled for completion next January, will increase the Firestone Tire and Rubber Company's capacity for the production of synthetic rubber by nearly 12%. The plant, an addition to the Firestone Petrochemical Center, is designed to produce both Coral, a 'synthetic natural,' and Diene, an extender blended with natural rubber in tyre production. The facility will have an annual capacity of 30,000 tons of either Coral or Diene. The company's present synthetic rubber capacity is 251,000 tons a year at plants in Akron; Lake Charles, Louisiana; and Pottstown, Pennsylvania.

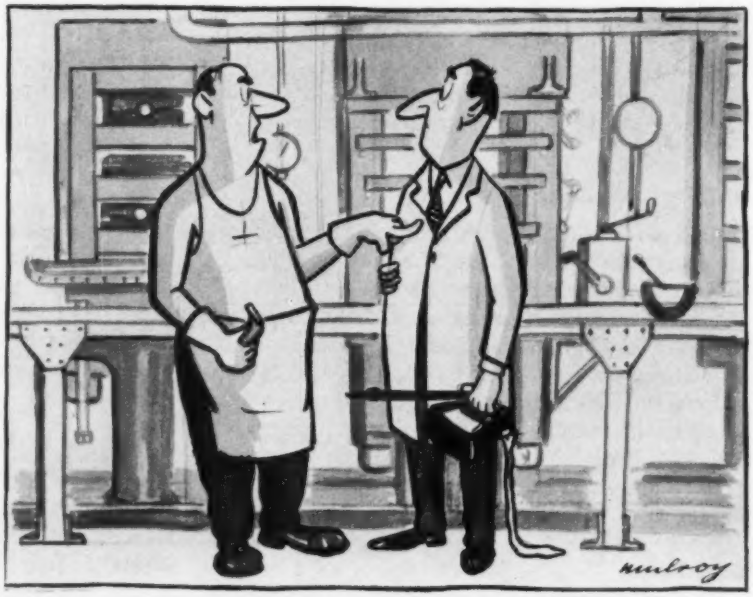
●**Holland** — The Netherlands-American Motor Tyre works, a joint venture of the Dutch Vredestein concern and B. F. Goodrich, now has an output of 3,500 tyres a day compared with 1,800 units in 1956. Research and development is to be extended with a view to the Common Market; the plant has an adequate production capacity but more workers are needed to increase output. Vredestein, with four rubber plants in Holland, claims to be the largest producer of rubber goods in the Benelux countries.

●**Roumania** — A three-year trade agreement has been signed by the United Kingdom and Roumania. The quota list for UK goods for import into Roumania during the period November 10 1960 — September 30 1961, contains plastics materials (value £400,000) and rubber products including but not limited to tyres and tubes, covered and uncovered rubber thread, synthetic rubber and surgical rubber goods (value £100,000). Also listed are asbestos manufactures (excluding asbestos cement goods and brake and clutch linings — value £50,000).

●**United States** — Implementing and expanding the close relationship between Allied Chemical Corp. and Snia Viscosa of Milan, Italy, in the chemical, plastics and fibre fields, Allied has announced that it has acquired Snia Viscosa's new process for the manufacture of caprolactam. This process, not yet in commercial use, was developed in the laboratories of Snia Viscosa from whom Allied has acquired exclusive rights for USA and Canada.

●**Argentina** — A contract between the Government of the Province of Santa Cruz, Argentina, and Texas Butadiene and Chemical International Ltd., for the installation of a petrochemical plant, was recently approved. The agreement comprises the setting up of plants for the manufacture of synthetic rubber with an initial yearly capacity of 40,000 tons, to be increased later to 60,000 tons.

●**Sweden** — An Esso cracker at Stenungsund will supply nearby plants which will manufacture polythene and ethylene oxide. Total investment in the three units is said to be £13½m. The polythene plant, which is to have a capacity of 15,000 tons a year, is to be run by a new company formed by Union Carbide and the Swedish concern Fosfatbolaget. The cracker is expected to come on stream in two years' time. This venture will be the first in Sweden in the petrochemical field.



'I'll tell you why you don't want me spittin' on the platens matey — it's because you're scared of being made redundant, that's why!' — 511

RABRM Becomes RPRAGB

PLASTICS AND RUBBER RESEARCH TALKS CONCLUDED

THE Research Association of British Rubber Manufacturers is to be called the 'Rubber and Plastics Research Association of Great Britain.' Negotiations that have been taking place since 1958 between the British Plastics Federation, RABRM and other bodies, have been successfully concluded.

The announcement was made by P. W. Howard, the president of RABRM, at an extraordinary general meeting of the association on November 15. He said that the new organization will be registering plastics firms as members from January 1 1961 and consequently 'there is still time for more firms in the plastics industry to become registered among the "plastics founder members" before that date.'

So far 70 members of the BPF — about a third of the membership — have agreed to join the new association. It is understood that membership will be based, for plastics manufacturing companies, on 4s. per ton per annum of plastics materials bought, with a minimum membership fee of £100 and a maximum of £500.

Mr Howard indicated that the new name would be registered in a week or so. He thanked those members of the BPF who — under their chairman, David Radford — had played a leading part in the negotiations. Chairman of the exploratory committee was A. A. Heath (managing director, Permali); other members were H. A. Collinson (managing director, Leicester Lovell) and R. P. Anderson (director, Ebenestos Industries). They have since been joined by David Radford, C. J. G. Stanley (BPF) and Finlay Walls (vice-chairman BPF).

The Pioneering Section

The RABRM president did, however, emphasize that 'support comes from only a comparatively small pioneering section of the plastics industry, but represents all sections of it.'

Comment from David Radford was that he was sure it would be of mutual benefit to the two industries, scientifically and economically. 'The British Plastics Federation will continue to have its own library and service of abstracts and information in London. Research will be done at the existing laboratories of the rubber industry, at Shawbury, near Shrewsbury, and work has already begun on new buildings, with an area of 14,000 sq. ft., to house the additional personnel and equipment for plastics research.'

'The idea of a combined research association was first put forward four years ago. In 1958 the BPF set up a fact-finding exploratory committee which held consultations with the Department of Scientific and Industrial Research, who indicated that approved joint work would be grant-aided. After investigating the work at Shawbury and the expansion there into plastics research, the committee recommended a joint association in April 1959; this was accepted by the executive committee of the BPF, and since then negotiations have been taking place.

Polymer Masterbatch Plan

Polymer Corporation of Sarnia, Canada, plans the installation of new facilities to produce a range of black masterbatch rubbers. The design work for this project is said to be well advanced, and it is expected that construction will get under way soon.

The new facilities, which will be located in Sarnia, will cost 'in excess of $1m.' and are scheduled to be completed in the latter part of 1961. They are part of the Polymer expansion scheme recently announced (*RJIP* Nov. 12, 800).

John Bull Go Slow

Five hundred workers at the John Bull's Grimsby factory are now on a four-day week. Forty have been laid off.

This is due to the recession in the car industry.

Llandarcy Styrene Plant

FORTH CHEMICALS PLAN £3m. PROJECT

A NEW 50,000 tons a year styrene monomer plant is to be built between Neath and Port Talbot, South Wales, at a cost of more than £3m., it was announced on November 14 by Forth Chemicals Ltd. The new plant will be located next to the site selected by British Hydrocarbon Chemicals for its own recently announced expansion plans, near to British Petroleum's Llandarcy refinery.

Design and engineering of the new Forth plant will be carried out by Monsanto Chemicals Ltd., and the plant is expected to take approximately two years to come into operation.

Biggest UK Manufacturer

Forth Chemicals is two-thirds owned by British Hydrocarbon Chemicals (which is jointly owned by British Petroleum and Distillers) and one-third by Monsanto. It is the largest UK manufacturer of styrene monomer. Its Grangemouth plant, built in 1953, has been twice expanded and a third expansion currently approaching completion (design and engineering work are also being carried out by Monsanto) will bring total production there to 50,000 tons a year. The completion of the new Welsh plant will consequently bring Forth's total production to 100,000 tons a year.

This year's chairman of the Forth board is Sir Miles Thomas, chairman of Monsanto, who is also chairman of the Development Corporation for Wales. In this last capacity Sir Miles has expressed the 'great satisfaction that the people of Wales will feel at this latest addition to their growing and increasingly diversified economy.'

The ethylene feedstock for the new plant will be provided by British Hydrocarbon Chemicals, and benzene will be bought from outside sources.

When BHC announced its £10m. Llandarcy project it indicated that the pattern of operations would follow that of Grangemouth. This announcement is the first piece of the pattern to be fitted into place.

Silicone Price Cut

Midland Silicones Ltd. have cut the price of DP 2403 self-adhering silicone rubber by 5s. a lb.— from 36s. to 31s.— only three months after reductions of up to 10% were announced for 15 other grades of silicone rubber.

DP 2403 is a self-adhering grade of silicone rubber stock which can be dispersed in solvent, extruded or calendered to produce either unsupported or glass-cloth reinforced insulating tape.

The Industrial Photographic and Television Exhibition will be held at the Albert Hall from November 21-25.

Terylene Plant in Ireland

I.C.I. PROJECT MAY INCLUDE POLYPROPYLENE FIBRE

IMPERIAL Chemical Industries Ltd. have completed the purchase of some 200 acres of land at Kilroot, Antrim, Northern Ireland, as a site for a factory for the manufacture of Terylene and possibly other man-made fibres.

Terylene polyester fibre is at present being manufactured at Wilton where extensions now under construction are due to come into full operation in 1962. As was announced in 1958, it is I.C.I.'s intention to locate Terylene spinning plants in Northern Ireland as and when the development of the market for Terylene makes these necessary.

In August this year, I.C.I. acquired from Montecatini of Milan exclusive rights for the production and sale in the United Kingdom of staple fibres, filament yarns and textile monofilaments from polypropylene. The initial manufacture of polypropylene fibre is being undertaken at Wilton, but it is possible, the company says, that this fibre will also be manufactured at Kilroot in due course.

Site development at Kilroot will begin early in 1961 with a view to starting production in 1963. When full production has been achieved, a labour force of about 1,150 will be required and, if the project succeeds in accordance with expectations, this will be expanded to at least 2,000.

Cariflex Price Cut

Shell Chemical have reduced the price of Cariflex SP-103 from 28d. per lb. ex store to 27.75d. per lb. ex store. The new price has been effective since November 14. Cariflex SP-103 is a self-reinforcing masterbatch containing equal parts of high styrene resin and low Mooney rubber.

Reichhold Expansion

MOVING FROM CARSHALTON

A NEW plant is to be built by Vinyl Products Ltd. and Vinatex Ltd. at a 100-acre site at Brockhampton, Havant, Hants. Only two months ago the new Vinatex factory at New Lane, Havant (near the main site), was completed; it is expected to be in full production this month (*RJIP* Sept. 24, 451).

This expansion, which will include extensive offices and research and development laboratories, means that the companies will be moving from the Carshalton, Surrey, plant in 2-3 years' time.

Vinyl Products are the biggest UK manufacturers of emulsions and solutions of a wide range of synthetic resins, including polyvinyl acetate, vinyl acetate copolymers, acrylate and methacrylate polymers and copolymers and polystyrene. Vinatex is a major producer of PVC compounds, pastes and sintering powders. Both companies are members of the Reichhold Chemicals group.

DCL Plans Overseas Division

Distillers chemical group has decided to set up an overseas division which will be responsible for Distillers' overseas chemical interests. Dr H. K. Whalley, formerly division director in charge of development, will head it, assisted by P. L. Bramwyche.

In Australia, DCL has a 40% interest in CSR Chemicals (Pty.) Ltd., Sydney, which makes organic chemicals and plastics, mainly from local raw materials.

NR in Public Works

'Rubber in Roads and Public Works' was the theme of the Natural Rubber Bureau's exhibit at the Public Works and Municipal Services exhibition at Olympia last week. The main display illustrated the superior performance and versatility of rubberized roads in locations all over the world where conditions are particularly exacting. These included the Birmingham Ring Road (heavy traffic, concrete foundation, on a flyover); Montague Street, Melbourne (heavy dock traffic, surfacing laid over wood blocks) and Queensland (rough country, tropical conditions).

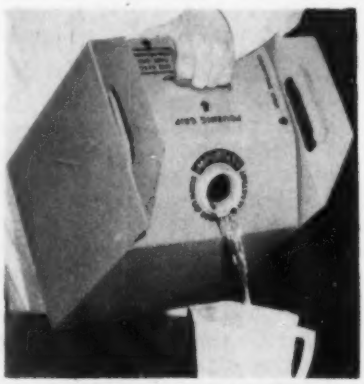
Other features of the display were a series of revolving panels showing a score of new applications of rubber in building, engineering and public works and a 6ft. high decorated map of Malaya 'planted' with several thousand miniature rubber trees.

Masons to Close Down

A. Mason (Rubber) Ltd., the Oldham waste rubber firm, has decided to terminate business operations on November 30. The concern was founded in 1884.

Fibreboard Polythene Container

Following on the recent announcement that the Reed Paper Group has entered the plastics packaging field (*RJIP* Nov. 12, 800), Reed Corrugated Cases Ltd. is now marketing a new non-returnable corrugated fibreboard clad polythene container. Designed for the carriage of a wide range of products in liquid and loose powder form, the container eliminates the need for returned container turn round systems and the associated accounting routines.



The new Reedac fibreboard-clad polythene container for liquids and loose powders. Pouring aperture has been designed to avoid spillage when pouring even small quantities

Strength and rigidity are features of the pack, which gives four thicknesses of heavy board at the top and base and double thickness on the four walls.

The polythene vessel is manufactured by the new company, and is fitted with a polythene screw cap. A 5-gallon size is now being marketed and shortly a range of sizes, including some specifically designed for export purposes, will be introduced.

The Railway Clearing House has given full approval of the composite container for the carriage of goods classified by them as non-dangerous.

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MacroPlastic Exhibition

FURTHER IMPRESSIONS FROM UTRECHT

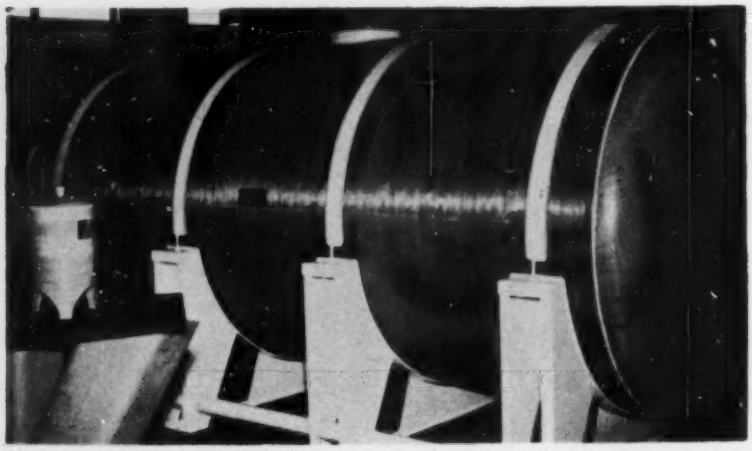
AS mentioned in the previous report on the macroPlastic Exhibition which appeared in *RJIP* November 12, plastics seem to have been accepted by the Dutch people, and indeed by most continental countries, as satisfactory constructional materials in their own right, rather than as substitutes for more conventional materials.

In no direction was this more apparent in the exhibition than in the very large number of applications where glass reinforced polyester and epoxy resin laminated products have replaced traditional materials, particularly in the ship and building industries and in industrial applications such as the manufacture of large containers, tanks and pipes.

Holland has many miles of canals and it is therefore not surprising that the boat building industry should be such a flourishing one or that modern construction methods should have become widely used. The visitor to Utrecht was confronted at every turn by boats of all types made from reinforced plastic among which the most impressive was the 29ft. sea-going yacht made by Werkspoor NV, a photograph of which appeared in *RJIP* October 8, 530. Lifeboats were displayed by Hoop and Zonen, De Vries Lentsch and van Wijk and Boerma, and there were smaller sailing boats and dinghies on many other stands.

Reinforced Containers

Among the many tanks and containers on show, the stand of Ateliers Belges Réunis SA included a very interesting range of large capacity tanks up to 10,000 litres in polyester/epoxy sandwich construction. These were of both round and square cross section and some were specifically designed for mounting on trucks and are in use for the transporting of liquids including beer, spirits, wine, milk and many chemicals. Also displayed by the same firm were large diameter glass reinforced polyester pipes. The Dutch firm Bruzon were exhibiting cylindrical tanks 200cm. in diameter in glass/polyester and claimed that there was virtually no limit to the length of tank which could be built.



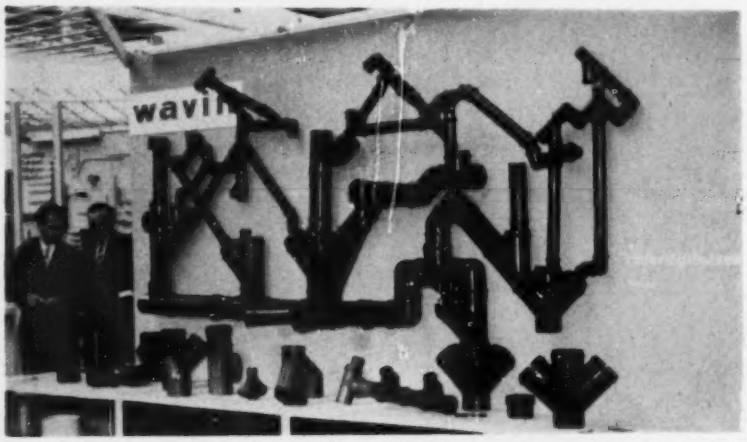
Glass-reinforced plastic 6,000-l.-capacity tank made by Ateliers Belges Réunis S.A. Designed for mounting on a truck for bulk transport of liquids

Bristol Piping

One British exhibit in the field of reinforced plastics which attracted much attention was the Epoch system of piping developed by Bristol Aeroplane Plastics Ltd. A unit for the production of this piping has been developed by Bristol in which most of the operations are carried out automatically and are controlled by a punched card system thus guaranteeing a consistent, high quality product. The pipe system was developed to meet the demand for large bore, highly corrosion-resistant pressure piping in such industries as oil, gas, atomic energy, chemical engineering and shipping.

Pipes and fittings are produced from epoxy resins reinforced with glass cloth and roving, the inner and outer surfaces are reinforced with acrylic fibre to give maximum resistance to chemical attack and to achieve a high measure of abrasion and damage resistance.

This corrosion resistance reduces maintenance costs and results in high operating efficiency, the very high standard of internal finish ensures constant carrying capacity with low friction losses, and the light weight of the pipes (about one quarter that of equivalent steel pipes) result in



One of the most outstanding exhibits of piping on the stand of Wavin NV, specialists in the production of pipes for water supply

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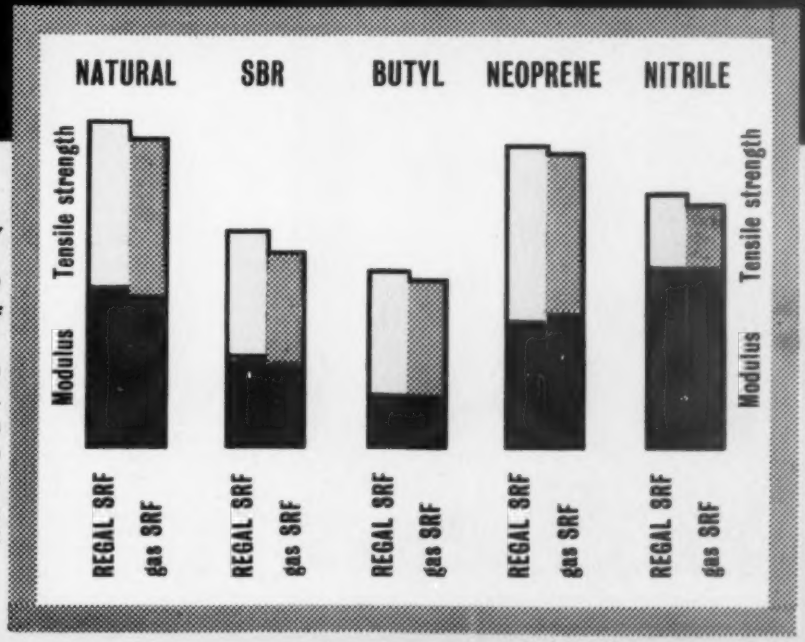

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substantial savings in installation costs. These pipes are supplied in lengths of 20ft. as standard, but can be supplied made up into 60ft. lengths if required, in a range of bores from 6in. to 15¼in., and there is also a comprehensive range of tees, bends, elbows, restrictors, adaptors and flanges. Trial lengths of this pipe system have been installed by several of the largest chemical and petroleum concerns in this country with very encouraging results.

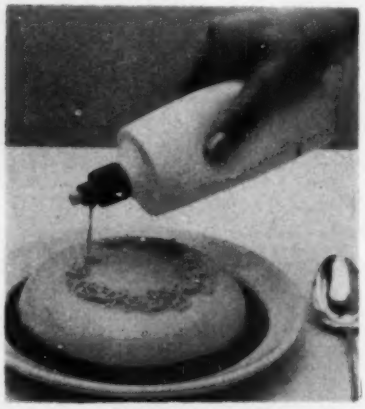
The Japanese have used PVC widely in building applications for some time and one novel development was shown on the stand of Sekisui Chemical Co. This was a corrugated transparent PVC sheeting reinforced with thin wire mesh giving good light transmission and very high strength characteristics.

New Plant

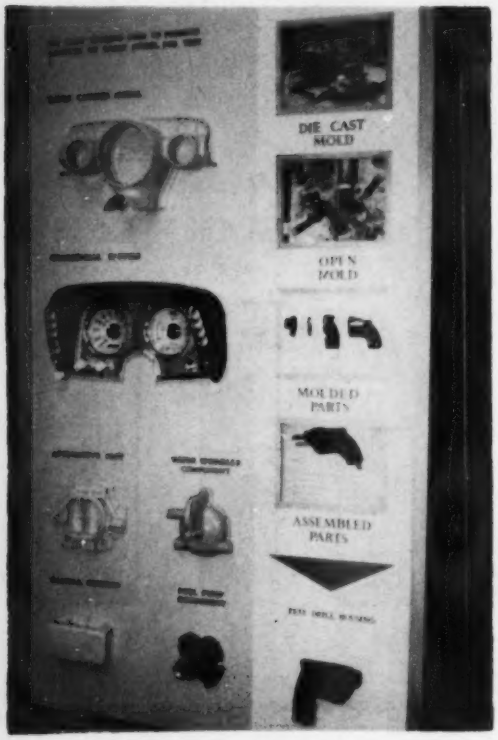
At a Press conference held during the exhibition by Du Pont it was announced that a new multi-million guilder plant was to be built at Dordrecht in Holland for the processing of Delrin, the latest addition to the Du Pont range of plastic materials. The company are also planning to build a plastics design laboratory in Geneva, the main purpose of which will be to help European manufacturers develop new applications, primarily for Delrin and Teflon fluorocarbon resins. This laboratory is expected to be ready in April 1961 and the plant at Dordrecht is scheduled to begin operations in 1962.

Polythene boat and large-capacity polythene tanks manufactured by Vaessen-Schoemaker N.V. using the Engel process

Another American company which took the opportunity of announcing new products was Owens-Corning Fiberglas whose extensive research programme has resulted in five materials being put on the market recently. These are a new roving for use in a gun depositing resin and glass simultaneously in a mould, a reinforcing mat with an acrylic binder for use in the manufacture of acrylic flat and corrugated sheets, two spun rovings with improved wet-out properties and a high strand integrity chopped strand product. Two other developments which are expected to be on the market during 1961 are an improved, more uniform mat and a compound of glass flakes and resin to be used as an anti-corrosion protective coating.



Druflex self-opening closure, a hygienic and economical polythene cap for squeezable containers



Part of the wide range of components made from Delrin acetal resin which were displayed on the Du Pont stand. Among these were many automobile parts, including the instrument cluster housing in the centre of the photograph

Packaging

There is to be a packaging exhibition at Utrecht in May 1961 called MacroPak and presumably because of this there were very few exhibits dealing solely with this expanding field. One such application, however, although not actually displayed in the exhibition, was brought to the attention of several interested people. This was a very neat dispenser cap for use with flexible bottles patented by Druflex Holland, 191 Nieuwe Gracht, Utrecht, who are able to manufacture these closures very cheaply and are interested in finding companies in this and other countries to manufacture them under licence.

Continued on page 848

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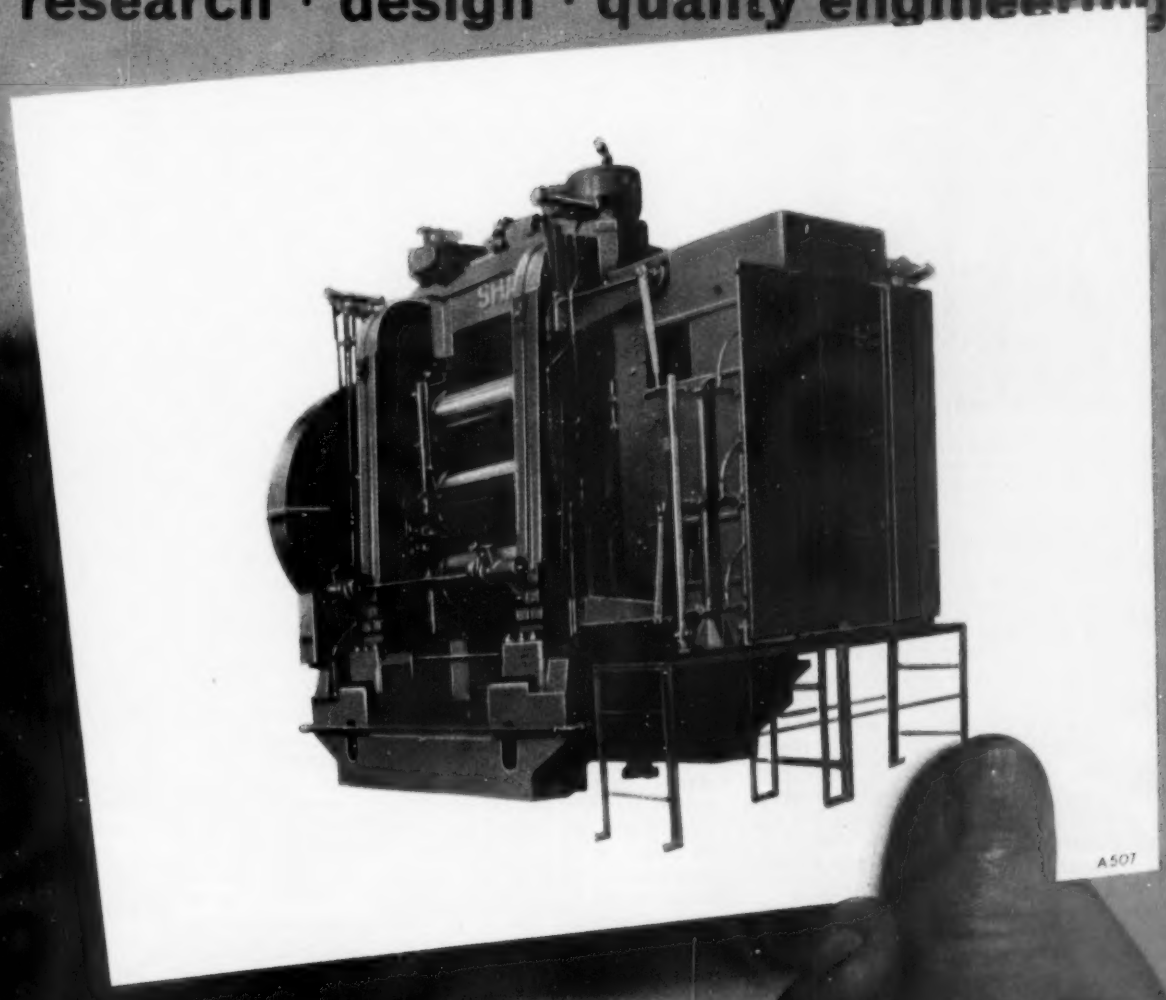

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OVERSEAS AGENTS THROUGHOUT THE WORLD

P4094

Anderson Laboratory Opened

THE new laboratory building of James Anderson (Colours) Ltd., of Paisley, was opened on November 2 by Lord Polwarth, chairman of the executive committee of the Scottish council (development and industry).

At the opening of James Anderson's new laboratory were *(left to right)*: **C. A. Staehelin (director, J. R. Geigy S.A., Geigy (Holdings) Ltd.); Baillie James MacWalters (senior magistrate of Paisley); A. H. Whitaker (chairman, James Anderson and Co. (Colours) Ltd.); E. G. Turner (chairman, Geigy (Holdings) Ltd.); and Lord Polwarth**

Anderson is a member of the Geigy group.

The building is a block of 11 laboratories used for pigment research and development work with chemists' offices, a library and conference room. The floor area is 12,000 sq. ft. and the total cost was £170,000.

Lord Polwarth was received and introduced by E. G. Turner, chairman, Geigy (Holdings) Ltd., and opened the door of the new building with a gold key presented by the architect. He and several parties of guests were then shown over the new building and the works.

At a luncheon afterwards in Paisley Town Hall, Lord Polwarth proposed a toast to the president of the Swiss confederation and spoke of the value of strong links and close co-operation between Britain and Switzerland, such as the Geigy group embodied so effectively.

He welcomed the extension to the works of James Anderson as a considerable contribution to Scotland's industrial wellbeing, and emphasized the particular importance of research in the expansion of British industry as a whole.

Lord Polwarth was introduced by A. H. Whitaker, chairman of James Anderson and C. A. Staehelin, a director of J. R. Geigy SA, of Basle and of Geigy (Holdings) Ltd., spoke in reply.

This is the second new laboratory in the Geigy group to be opened in the UK in recent weeks. On October 14 a large new building, including a laboratory, was opened at the Ashburton Chemical Works, Manchester.

Some of Geigy's latest pigments have been developed to overcome dispersion difficulties in polyolefins. The new range of Irgafiner pigment powders disperse rapidly without special processing. Work in this and other fields will be considerably expanded at the new laboratories.

Pirelli's New Chairman

Sir Gerard Clauson is to be the new chairman of Pirelli Ltd. He succeeds Peter Thorneycroft, who resigned last July on his appointment as Minister of Aviation. Sir Gerard, who is 69, has had a distinguished career in the Army and the Colonial Office, where he was assistant under - secretary of State from 1940 until his retirement. Before joining the board of Pirelli in August 1953, he took a keen interest in the world rubber industry, and in 1951 was chairman of the International Rubber Conference.

He was made a member of the Order of the British Empire in 1919 and created a Knight Commander of St. Michael and St. George in 1945.

Barbara Watt has joined Fablon Ltd. to handle consumer public relations.

MacroPlastic Exhibition

Continued from page 846

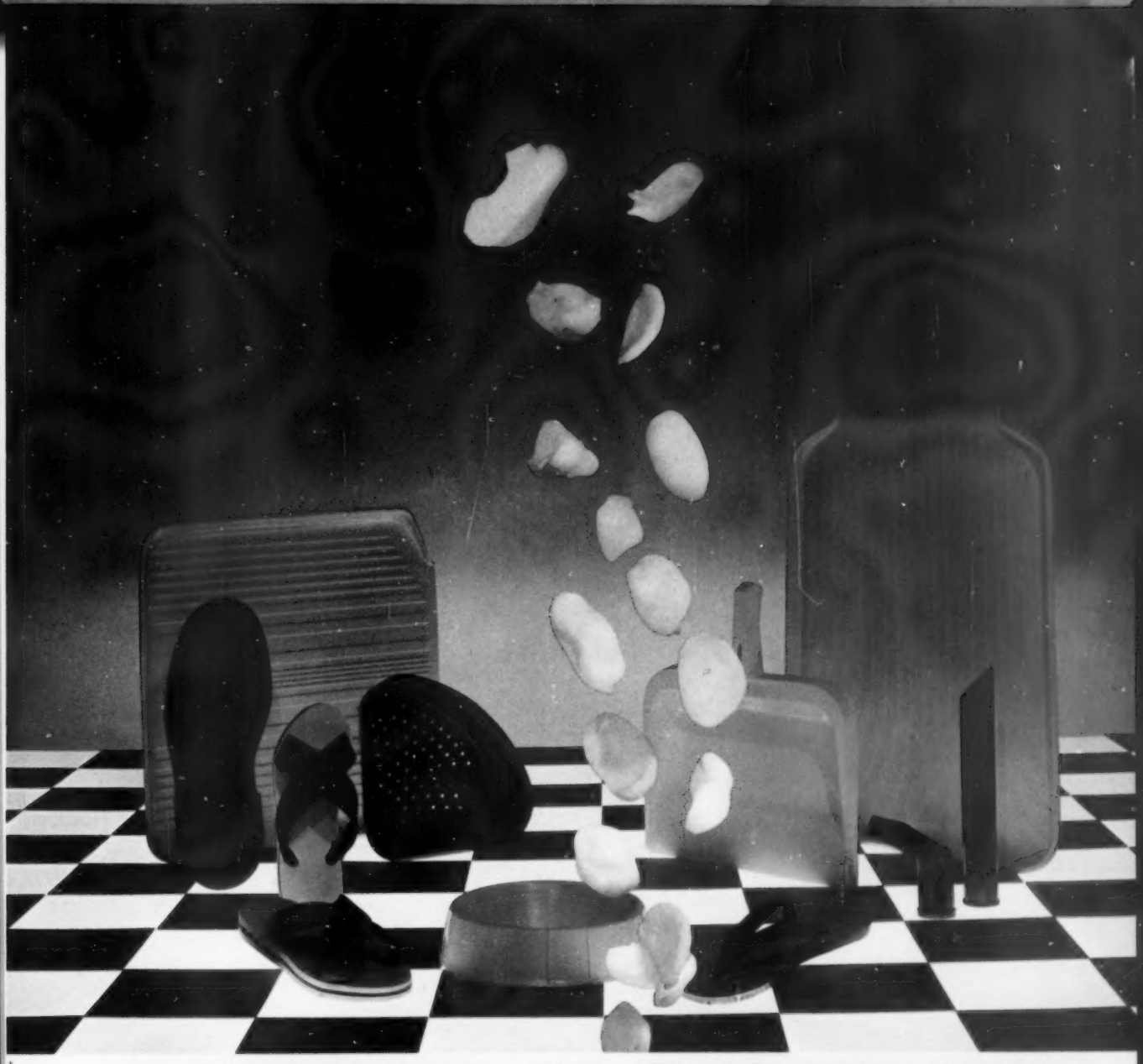
Plastics in Agriculture

Considerable quantities of plastic film and pipe are being used in agricultural applications and the Dutch Institute for Horticultural Techniques stand showed the various applications which are in use or in course of development. Among the latter are plastic coated wire mesh for soil warming and the use of perforated pipes for drainage purposes and there appears to be a wide field open for further developments.

To conclude on a general note, the organizers can be assured that they have succeeded in no small measure in putting the Dutch plastics industry on the map. It was estimated that more than 45,000 people had visited the exhibition stand before the last day and most of the exhibitors expressed themselves as being very satisfied with the number of enquiries and orders received.

C. M. Fisher has been made managing director of Firestone's plant in Manila, Philippines.

Farbenfabriken Bayer A.G. included in their display a wide range of products made from Makrolon polycarbonate, of which this breakfast set is an example



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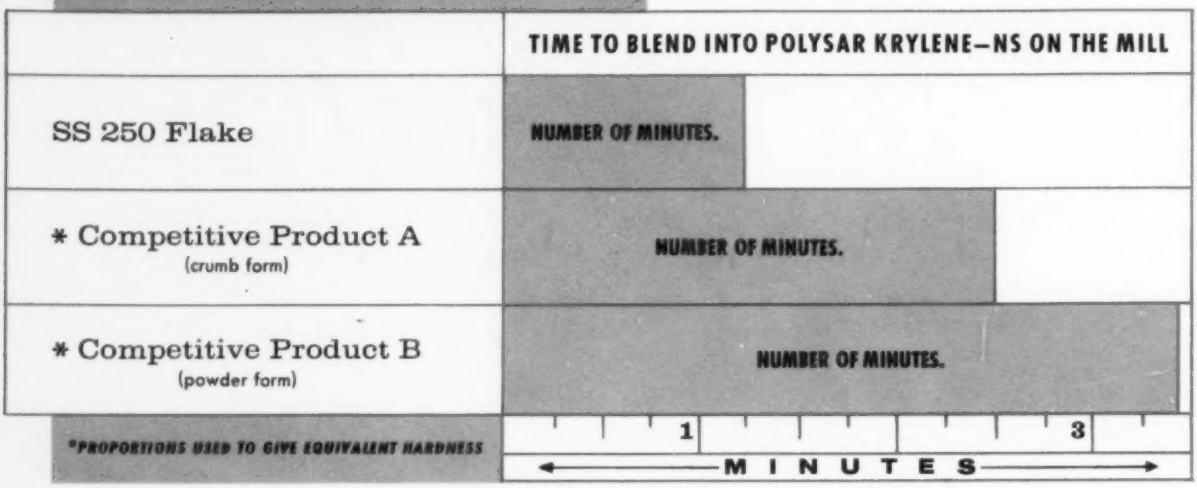

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Rubber Suspended Trains

WIDE USE OF PLASTICS IN NEW TUBE COACHES

RUBBER and plastics are featured in a number of applications in new trains which went into service on London Transport's central line on November 9. Rubber has been used in the bogie bolster, axlebox suspension and power cabling, while laminated plastics have been chosen for much of the interior panelling.

The draught screen units at the doorways are GRP mouldings. The large, double-glazed windows, set in rubber mouldings, are twice the size of the windows in the old design

The recent decision to equip the central line with 1959 tube stock of the type already being delivered to the Piccadilly line (*RJIP* January 9, 64), has meant that the three prototype trains will not now be the pattern for the future central line stock. But they will, London Transport says, provide a great deal of information and experience of new features of rolling stock and equipment design.

The bogie bolsters are of fabricated construction, stress relieved and provided with side bearing rollers and plain centre bearings. Bolster and axle box springing is achieved with the use of rubber units, the axle box springs being in the form of chevrons fitted in a 'yoke' casting. Hydraulic dampers are fitted to limit vertical and lateral oscillations.

Power Cabling

Because of the increased current demands on the main equipment, it was necessary to use power cables of a larger copper section, but with no additional space available the overall diameter of the cable could not be significantly increased. An alternative insulating material was therefore sought, which could have a reduced radial thickness without sacrificing dielectric strength. Several alternatives were considered to the present standard cable, which has natural rubber insulation and flame-proof cotton braiding, and it was eventually decided to use a composite NR/neoprene cable (R/N cable) which has a natural rubber dielectric with a neoprene sheath.

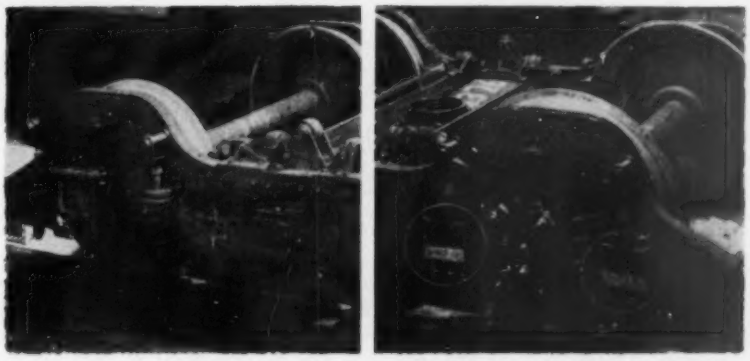
Although this new cable has lower specific insulation resistance than the flame-proof braided type, it gives a higher overall insulation resistance on a complete car because of the elimination of the flame-proof braiding. In addition, the neoprene sheath will have improved resistance to abrasion, ozone and oil. To obtain comparative data on the insulation resistance of complete cars and gain experience with the new cable, half the motor cars and half the trailer cars are wired with R/N cable, and the remaining half with the standard flame-proof braided cable.

Other parts of rubber are the traction motor leads which are a NR/neoprene cable with an additional thickness of neoprene for mechanical protection, and the door edgings. The ¼in. thick windows are set in rubber mouldings.

Stardust Finish

Wide use has been made of Warerite panelling with a stardust finish for the body ends and in the saloons.

Draught screen units at the sliding doorways have been formed in reinforced plastic mouldings. Similar mouldings over the doors house the fluorescent lighting components and are hinged for maintenance access. GRP mouldings are also used to form the interior finish at the bulkhead corners at the trailing end of the car. The moulding on one side houses the emergency candle lamp and the fire extinguisher.



(*Left*) **Part of the bogie of a pre-1938 Tube stock trailer-car before conversion, showing auxiliary metal coil springs.** (*Right*) **One of the new bogies, showing auxiliary rubber springs by Metalastik (circled)**

A new addition — called M3 — to the range of Wolkogon strip-packaging machines has just been announced by the Packaging Division of Gordon and Gotch Ltd., first UK agents for the range.

GRP Rooflight

A new Cascalite rooflight in reinforced plastics is being made by Cascelloid in a basic 6ft. wide (nominal) x 2ft. modular length ventilating or non-ventilating unit. This provides for wide scope in arrangements and for simpler planning. There are four alternative types of ventilation — fixed louvres, adjustable metal louvres, fan and baffle, or a standard unit with mounting for mechanical extraction unit.

Superior Processing Rubber

UNIQUE AID TO MANUFACTURE

(Concluded from November 12 issue, page 812)

By H. C. BAKER and S. C. STOKES, NRPRA.

SOME of the results obtained in a study using larger scale equipment are given in Table 2 to illustrate the points discussed earlier. Thus, in whiting/clay loaded stocks based on cold and oil-extended SBR, PA 80 shows to general advantage. Examples are also given of the use of PA 80 in a 50 part HAF compound based on oil-extended SBR, either at its original level of Mooney viscosity (100) or brought to similar viscosities, 40-45 and 22-23, by peptization or milling. When to Mooney viscosity of PA 80 is brought to 45 by mastication, throughput is maintained at the level of the SBR control compound without affecting the SP characteristics. Peptization of PA 80, however, tends to destroy SP properties, and although the compound containing PA 80 peptized to 22 Mooney Viscosity gives greater throughput the die swell is that of the oil-extended SBR control.

Shrinkage Control

In other than extrusion processes, SP rubbers and PA 80 are often advantageous, for example, in calendering operations for better control of the gauge and for reducing shrinkage of calendered sheet for stock preparation and for hand-built goods.

Examples of the control of shrinkage in single nip sheeting of stocks allowed to recover freely are given in Table 3 for a number of footwear compounds based on natural and styrene-butadiene synthetic rubbers. It will be seen from Table 3 that PA 80 is considerably more effective in controlling shrinkage than a similar ratio of cross-linked SBR 1009. In translucent soling compounds, both PA 80 in SBR and SBR 1009 in pale crepe impair translucency, but PA 80 is less harmful in SBR than is SBR 1009 in pale crepe. A possible disadvantage of PA 80 in this type of compound is the increased compound viscosity, and either a blend of PA 80 and ordinary NR or premasticated PA 80 may be a better processing aid in such cases.

TABLE 2

COMPARISON OF SBR (100 PARTS) WITH SBR/PA 80 (75/25 PARTS) IN A BASE COMPOUND CONTAINING 5 ZINC OXIDE, 1 STEARIC ACID, 2 SULPHUR, 1.2 CBS (SANTOCURE), WITH SULPHUR AND ACCELERATOR PRO RATA FOR UNVULCANIZED RUBBER. EXTRUDING CONDITIONS CHOSEN TO GIVE BEST ALL-ROUND RESULTS FOR EACH COMPOUND

Filler loading	Whiting 50/clay 50						HAF black 50					
Base polymer	SBR (cold)		Oil-extended SBR			Oil-extended SBR						
Additive	Nil	PA 80	Nil	PA 80	Nil	PA 80	*PA 80 M45	PA 80 P40	PA 80 P22	RSS P23	SBR 1009
Compound viscosity	61	75	44	65	62	92	85	82	64	57	78
Throughput, g./min.	920	1020	1100	1040	960	840	1020	940	1290	1200	960
Die swell, %	20	11	14	9	18	8	9	12	17	20	11
Mooney scorch, min.	41	27	41	30	21	12	13	—	15	17	20
Vulcanization at 153°C., min.	35	30	40	35	30	25	30	—	30	30	30
Open steam properties:											
Collapse, %	5	Nil	10	Nil	Nil	Nil	—	—	—	—	Nil
Shrinkage, %	3	2	2.5	1.5	6	4	—	—	—	—	5
Watermarking	Slight	Nil	Slight	Nil	Nil	Nil	—	—	—	—	Nil
Vulcanizate properties:											
Tensile strength, kg./cm.²	92	105	76	64	211	192	183	—	191	190	198
Elongation at break, %	680	660	610	600	330	300	260	—	310	300	280
Hardness	63	64	47	52	60	66	67	—	63	64	64
Compression set, %	43	35	33	28	21	22	25	—	21	20	21

* Additives (PA 80) masticated or peptized to the indicated Mooney viscosity before addition to the mix: e.g. M45 = masticated to 45 Mooney. Mooney scorch at 120°C.

TABLE 3

CONTROL OF SHRINKAGE BY PA 80 AND CROSS-LINKED SBR 1009 SYNTHETIC RUBBER IN VARIOUS NR AND SBR FOOTWEAR COMPOUNDS

Type of compound and base rubber	Principal fillers (p.h.r.)		Percentage increase in length over control compound for		
			SBR 1009 (1 : 3)	PA 80 (1 : 3)	PA 80 (1 : 1)
NR soling	Clay	55	5	15	26
	Calcium silicate	25			
SBR soling (cold non-staining)	Clay	90	6	30	51
	Calcium silicate	30			
NR black upper (C blanket crepe)	MT black	45	11	19	31
	SRF black	30			
NR white upper	Whiting	100	9	18	28
Translucent soling pale crepe	Reinforcing silica	20	17	44	68
SBR, cold, non-staining	Reinforcing silica	30	7	45	65
SBR, oil-extended, non-staining	Reinforcing silica	30	15	37	73

PA 80 in Neoprene W

Preliminary experiments on PA 80/chloroprene blends have been made with PA 80 in Neoprene W. Initial experiments with blends of these materials on an open mill indicated that blending was facilitated by premasticating the PA 80. Satisfactory blends with raw PA 80 and Neoprene W were subsequently made in a laboratory internal mixer.

Selected results for a sulphur vulcanized compound containing 60 parts MT black phr are shown in Table 4. In this compound, Neoprene W/RSS blends show no improvement in the rather rough surface of extrusions obtained at a standard screw speed of the laboratory extruder (40 rpm) but physical properties, particularly hot tear strength are somewhat improved. Blends with PA 80, however, display markedly improved surface features and reduced die swell, a 50/50 blend being similar to Neoprene WB in these respects. Physical properties remain approximately at the level of Neoprene W and superior to those of Neoprene WB.

PA 80 is therefore of potential interest for applications where maximum resistance to oils and weathering is not required, and generally for blends of Neoprene and natural rubber where these are used.

Conclusions

It is evident from laboratory and larger scale trials, and indeed from manufacturers' reactions, that no pro-

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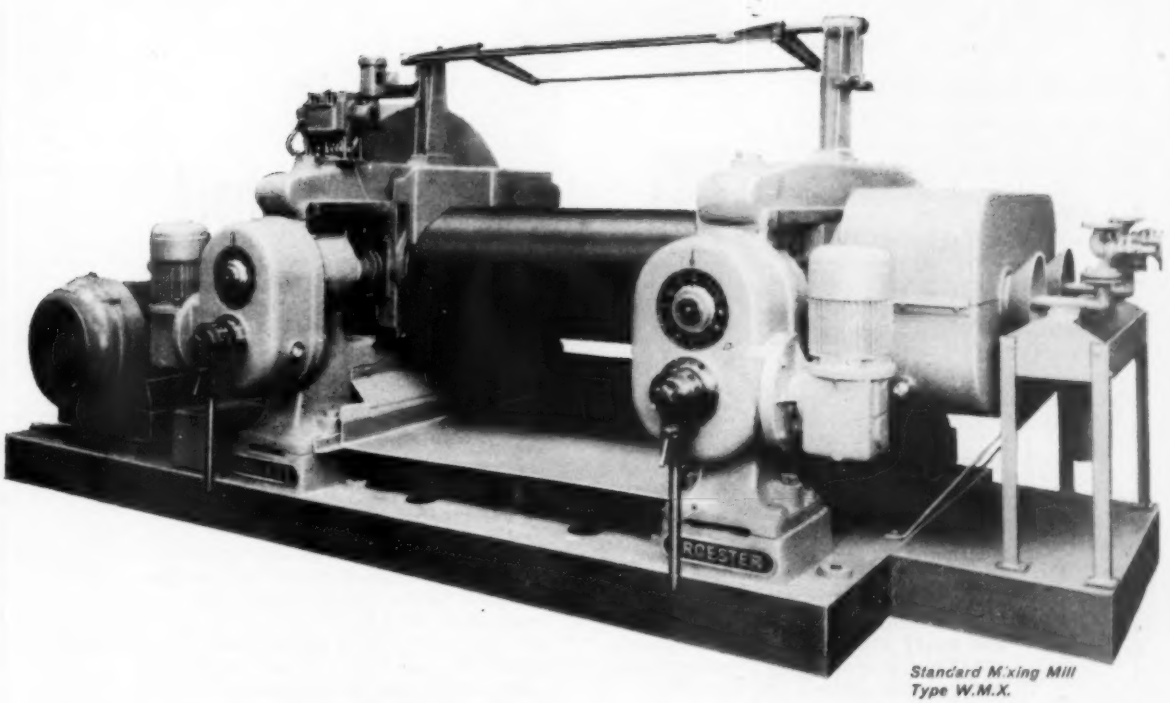

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cessing aid at present on the market is capable of conferring the excellent extruding characteristics which are obtained with PA 80, while maintaining a high overall level of physical properties. Nevertheless, in order that PA 80 should find even wider applications, manufacturers would prefer a material of lower viscosity to enable simple blending to be accomplished with any type of rubber. If, in addition, such a material should exert less influence on the scorching properties in order to obviate the necessity for adjustments in critical cases, this would be a further advantage.

TABLE 4

PA 80 IN NEOPRENE W : SULPHUR CURE

Compound: Rubber 100, stearic acid 0.5, P.B.N. 1, M.T. Black 60, Dutrex N 12. Curatives as shown

Neoprene W	100		75		50		75		50			
Neoprene WB		100										
PA 80 (premasticated)			25		50							
RSS							25		50			
Magnesia	4		4		3		2		3		2	
Zinc oxide	5		5		4		3		4		3	
NA 22	0.4		0.4		0.3		0.2		0.3		0.2	
TMTM	0.5		0.5		0.4		0.3		0.5		0.5	
DOTG	0.5		0.5		0.4		0.3		0.5		0.5	
Sulphur	1		1		0.8		0.6		1		1	
Compound Mooney viscosity at 100°C.	35		39		43		50		28		30	
Mooney scorch at 120°C./min.	11		13		10		7		17		8	
Extrusion rate, cm./min.	66.0		95.7		72.6		80.3		57.8		55.2	
Extrusion rate, cc./min.	45.6		42.0		40.2		36.8		37.7		39.6	
Die swell, %	75		11		40		16		65		81	
Cure at 153°C./min.	20		20		15		5		15		5	
	N	A	N	A	N	A	N	A	N	A	N	A
Tensile strength, kg./cm.²	142	138	113	104	149	137	142	137	160	136	170	146
Elongation, %	510	445	380	315	550	420	510	435	645	460	570	465
M 300, kg./cm.²	75	91	76	96	74	95	64	85	59	85	65	85
Hardness, °BS	55		57		54		53		50		50	
Tear strength, g./mm.	1575		430		1707		1442		913		1665	
Tear strength at 120°C., g./mm.	50		26		67		105		215		1050	
Volume swell: ASTM 1 %	4.0		3.4		23.3		63.1		25.7		75.2	
Volume swell: ASTM 3 %	89.6		75.7		137.4		189.1		146.1		210.2	

Volume swell after 70 hours immersion in ASTM oils Nos. 1 and 3 at 100°C.
N = New A = Aged

EFTA and Imports

In his presidential address at the recent purchasing officers' conference, A. H. Thomas, manager of purchasing, stores and raw material control, British Belting and Asbestos Ltd., spoke of the effects of the Outer Seven on British imports.

He felt that the escape clauses which had been included in the agreement would, if they were applied, create difficulties for buyers who had placed orders or negotiated contracts with companies in the Seven. Buyers should be ready to trim their purchases from these countries if a balance of payments crisis developed in the future.

Firestone Appointment

Paul D. Bowers has been promoted to the newly-created post of chief chemist for all North American tyre plants of The Firestone Tire and Rubber Company, it was announced recently by H. H. Wiedenmann, vice-president, tyre production. Mr Bowers, formerly manager of product engineering in the company's development department, has been with Firestone since 1928. He is a member of the American Chemical Society, the Rubber Division of ACS and the Akron Rubber Group.

Manchester Golf

The annual dinner of the Manchester section of the IRI golfing society will be held at the Grand Hotel, Manchester, on Friday February 24 1961.

Plastics Technology Course

Plastics Technology Laboratory Courses will be held at the College of Advanced Technology, Birmingham, from December 5-16. The course is arranged, in particular, for students who are unable to get practical instruction in their own locality to meet the requirements for the Associateship of the Plastics Institute.

Applications for admission should be made to The Registrar, College of Advanced Technology, Gosta Green, Birmingham 4. The course fee is £11.

Mr Cuthbert Mitchell has been appointed a director of Amalgamated Rubber and Industrial Products. Mr J. W. Barter, Conservative M.P. for North Ealing, is resigning from the Board, and from the Boards of Repetition Tyre and Accessories, Basic Rubber Products and Valox Rubber Products, subsidiaries in the Repetition group, as from November 30.

RJIP Prize Goes to Bolivian

THE *Rubber Journal* Prize of £25 for a student at the National College of Rubber Technology for the 1959/60 session has been awarded to Carlos Hajek.

Aged 24, Mr Hajek came to this country from Bolivia in 1955, after completing his education at La Salle College in Cochabamba. He joined the Technical College of the British Bata Shoe Co. at East Tilbury and took a two years part-time Licentiateship course at the National College.

After passing both the L.I.R.I. and L.N.C.R.T., and on completion of his training at the Technical College, he joined the full-time Associateship course, sponsored by the Bolivian Bata Shoe Co.

His hobbies are tennis and swimming.

NCRT Plastics Courses

A course in basic plastics technology at the National College of Rubber Technology, consisting of 10 afternoon sessions of practical work supplemented by lectures, will cover a basic knowledge of the processing of plastics. It will be held on Wednesday afternoons from January 18 to March 22 1961.

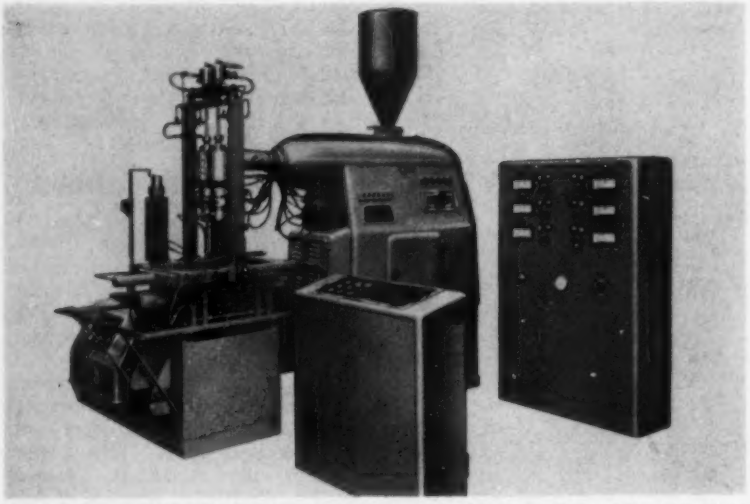
A comprehensive course of 11 lectures on PVC polymers, compounding ingredients and applications, will be held on Mondays at the college from January 9 to March 20. Fee: £2 3s.

Full details can be obtained from the head of the college.

Blow Moulding Machine

GERMAN DESIGN — BRITISH BUILT

THE Fischer BM 500 S blow moulding machine has been manufactured in Germany for approximately a year, and was shown at the Hanover Fair in April. It is now being produced in Scotland by Matthew Wylie and Co. Ltd., Glasgow.



Wylie Fischer BM 500 S blow moulding machine, coupled with a 60/15 D Extruder capable of producing blown articles from 50 to 3,500 c.c.

The company has been engaged for over 50 years in the manufacture of boxmaking, woodworking and bottle labelling machinery and other equipment for packaging, and the production of this machine is their first venture into the ever expanding plastics packaging field.

The machine is of robust construction and compact design, and is suitable for use with either a double or single vertical extrusion head. Two hollow articles up to 500cc. or one up to 1,000cc. can be produced per cycle. These capacities can be increased where the shape of the article is irregular, up to a capacity of 3,500cc.

The electrical and temperature control equipment is mounted in two separate cabinets and is supplied by West Instruments Ltd. An adjustable time clock relay for predetermined setting of the blowing time from 0-60 seconds is provided. The cycle of operation commences with the extrusion of a pre-form inside which is the blowing tube. The thread forming section closes over this pre-form, tightens it on the blowing tube and separates it from the continuously extruded tube.

The separated pre-forms are then carried by the thread forming device down into the opened moulds, which then close and seal the bottom end of the tube. After the blowing phase the moulds open, the cooling phase is completed and the thread forming device opens and releases the blown article which drops onto a discharge conveyor for final cooling and stacking.

THE SEVENTH MEMBER

Henry Nicholas Ridley (1855-1956), naturalist, botanist, geologist, explorer and author, was installed in the University of Akron's international rubber science hall of fame yesterday. Ridley developed the 'herring-bone' continuous tapping method at a time when it was thought that a rubber tree could be tapped only once or twice a year. He is the seventh member of the hall of fame, and the third Englishman. Other members are: Goodyear, C. Greville Williams, Carl Weber, Henri Bouasse, Ivan Ostromislensky and Thomas Hancock.

Ridley was selected by a committee led by Dr Maurice Morton, professor of polymer chemistry at Akron and director of the Institute of Rubber Research. At a symposium and banquet marking the event yesterday, Dr G. Stafford Whitby read a paper on Ridley, a condensed version of which will appear in a future issue of *RJIP*.

Federation Second Advertising Course for Senior Executives

The Federation of British Rubber and Allied Manufacturers is organizing a second course for senior executives on December 5-6 at the premises of the IRI (4 Kensington Palace Gardens, W.8). The subjects dealt with will be roughly similar to those figuring in the first course last May but will devote particular attention to the problem of technical sales and sales of rubber components to other industries as distinct from consumer goods sales. In addition, time will be made available for questions and discussion after each lecture.

Any companies in the industry who have not yet nominated an executive or director to this course and would like to do so should get in touch with the Federation Secretary at 43 Bedford Square, London, W.C.1, before November 24.

This is the first picture issued by Metal Box plastics group of a design reproduced in multicolour offset printing on tapered polythene bottles (*RJIP*, **Nov. 5, 777**)

In rubber goods rebound is fine—it is expected. What you don't expect is that the initial cost of the rubber should bounce about. For that reason it is well to turn to INTOL SB Rubbers made by the International Synthetic Rubber Company. INTOL SB Rubbers are stable in price. This means that you avoid day-to-day price changes, you can calculate costs in advance, and you definitely save money. **INTOL SB Rubbers are now produced in a range of eight grades of solid rubber and four latices. Please write for details.**

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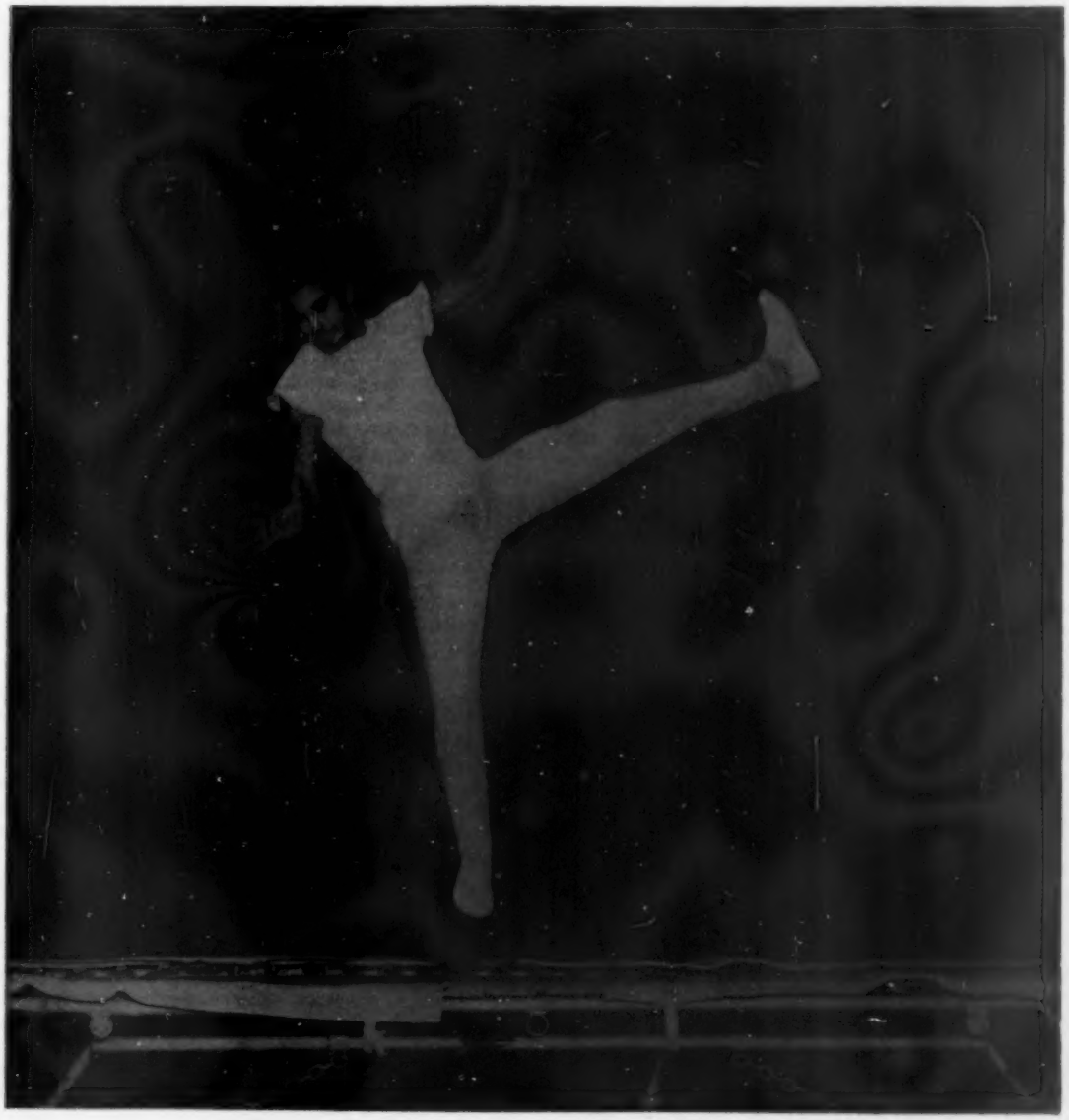


VIEWS and REVIEWS

MY mother used to have a ragbag in which she put all the pieces of fabric which 'might come in.' It was great fun for us children turning it out on a wet afternoon and my mother found it useful, she said, though I suspect it was to a very limited extent.

During the last month or two I have accumulated a few odds and ends which might come in for someone, because I know that 'Views and Reviews' is read widely, and sometimes raises pertinent questions.

Plastics Nozzles

One, left over from last week's discussion on polymers in rocketry, is the paper by G. Epstein and H. A. King, entitled 'Plastics for Rocket Motor Nozzles,' and appeared on p. 764 of *I/EC* for September 1960. It was left over not because it was lacking in intrinsic interest but because it was, after all, not really part of the same series as the other six papers of the symposium, and because I had no space for it when I had dealt with them.

The aim in designing a rocket nozzle is to secure lightness while maintaining stability of dimensions during firing and its severe thermal fluxes and mechanical erosions from the hot, high-velocity, propellant, combustion gases.

By using a specially-designed test-motor (called SPAR, from 'structural plastics ablative rocket') powered by gaseous hydrogen and oxygen, it was found that reinforced plastics are successful materials for making nozzles. Phenolic, and phenolic-silicone, heat-resistant resins were found to be superior to melamine and epoxy resins. Fibrous reinforcement/fillers were more effective than non-fibrous or powders. A high-silica-glass fabric was the best reinforcer tried — markedly better for example than 100 mesh, stainless steel screen. Orientation of the fabric, to provide an edge-grain effect, was an improvement. Protective, refractory coatings were, surprisingly, found to be detrimental.

Another paper in the same journal prompts the recollection that somewhere G. K. Chesterton has written that a work of literature consists in combining a murder committed in one street with a moustache seen in the other. That very method I take to be the basis of technical development — the adaptation of an idea or a technique, picked up generally from a technical journal, to one's own, apparently unrelated problem. Such cross-fertilization can prove highly fecund.

Bonded Sand

Engineers and builders especially, but perhaps polymer technologists too, will be interested in a paper on bonded sand in *I/EC* vol. 52, No. 9. September 1960, pp. 785-8, by A. S. Michaels, of MIT. Since the war there has been quite a large expansion in the volume of synthetic resins used for binding sand and so on. The high cost of such bonded aggregates has so far limited their wide application in building and, as the main item in the cost is contributed by the resins, it seems that there would be a large market here for a resin if it was cheaper, or if less of it was needed. This paper discusses the second approach — reduced binder — and describes experiments which show how an economic proportion of binder can be achieved.

It is based on a simple principle, that optimum bonding is reached when the adhesive is concentrated at the contact points of the particles; interstitial adhesive is excessive and much less effective. This desirable result can be effected by the use of suitable surface-active agents. In the experiments, a proprietary brand of dimethylaminomethyl phenol was added to the epoxy resin and the effect was to reduce the percentage of resin by weight from around 30% to about 8%, depending on the particle size of the sand used. Peak strengths reached surprisingly high figures — sometimes over 1,000 psi.

As would be expected, there was a tendency for the tensile strength to increase as the particle size of the sand decreased, probably because of the increasing number of contact points. This suggested that it might be possible to secure even further improvement by using coarse sand with fine sand to fill the interstitial voids. Experiment showed, indeed, that, providing the fine sand was added after the resin, 30% fines reduced by one-third the amount of resin required to develop any specified tensile strength. Further work is in hand on developments of the principle.

To state the principle more generally: adhesive is often wasted because it is merely filling holes and the ideal is to ensure that the surface activity of the system is such as to cause the adhesive to concentrate at the contact points of the material being bonded. This principle clearly applies directly to such other processes as making non-woven fabrics or bonding fibres, and a little reflection may suggest lines of work on reinforcing cellular polymers.

The Garden Next Door

We all need more time to be able to look over the fence at the next garden. (That, if I may say so, is the ultimate justification of 'Views and Reviews'!) I see that in his Presidential Address to last year's British Association meeting, Sir James Gray remarked '... no young scientist should be allowed to forget that new discoveries tend to arise from the borderland between different subjects where the discipline of one is applied to another.' Had he appreciated this, he says, he would have been a much better biologist. And, he goes on, it is not the facts, the isolated observations themselves, which matter, '... it is only when they fit into a satisfying pattern that the scientist feels he has achieved his end.'

The high polymer industry is essentially one wherein the constructing of such patterns is important; more than most industries, its continued progress depends on the synthesis of a diversity of skills and sciences. Have we enough people of the right calibre at the head, among the management, in the laboratories? Are we getting the right type of new entrants?

There is a tendency in some quarters to deplore the kind of technical man coming to the industry today. He is said to be not as good as those who preceded him, not

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **F. C. JENNINGS**

to know as much, not to be able to pass exams so easily. Be that as it may (and I think it is probably true) it is not so much knowledge that we want in our young people but the ability to handle knowledge, to put it to constructive use.

An article in the *Daily Telegraph* recently by Nicholas Bagnall reviewed two reports to the Minister of Education under the title: 'Change of Heart about Exams.' One report recommends not only an easier examination than the ordinary level of GCE but a totally different kind of test; both reports, indeed, recommended changes which have much in common.

Examinations for Intelligence

The first report, which was concerned mainly about examinations for entry to universities, wanted a paper, which 'while not enlarging the syllabus,' was specially designed to test a candidate's 'intellectual grasp and capacity to think about his subject.' The other wants examinations in 'what might be called "involvement" in their subjects... freshness of approach, intelligence ... as well as remembered facts and textbook learning.' The first report 'endorses what schoolmasters and dons have been saying for years — that the advanced level of the GCE puts far too large a premium on memorized facts to be a worthwhile test of academic ability.'

Sir James J. Robertson was saying the same to the British Association in 1959 in his address entitled 'What are our Schools For?' He argues that there is a difference between education and instruction, and pleads for such things as will 'quicken sensibility and nourish imagination.' He 'states the truth about the tyranny of the examination' and 'the exalting of memory and rote-learning at the expense of understanding and curiosity.'

I do not wish to disparage scholarship and the things of the mind. On the contrary. But I do want to protest against an education which is excessively textbookish. Consider, for instance, the Charles Goodyear Medal Award Lecture presented by W. B. Wiegand and reprinted in the *Rubber World* for September 1960. It is called 'Determinants in Research' and seeks to evaluate from his own life of research in the rubber industry the factors necessary to a successful research project. Not one of the six factors he isolates is learned in a classroom or from a textbook. Most of them are qualities of mind such as resourcefulness, subconscious integration ('hunches'), and contacts which 'widen his horizon, stir his imagination, and aid the incubation of his own research thinking.'

By resourcefulness, he means, he says, 'imagination and flexibility in working theories, together with contrivance and improvization in the laboratory. It is possible to be too flexible; there is a happy mean between flitting and roosting.' He recommends what he calls 'Inversion.' 'When one has run out of working theories, and the trend lines look as wide as they are long, it sometimes pays to turn the prevailing theory upside down.' I call that a type of resourcefulness but a reading of the whole lecture will show that Wiegand is praising the same qualities I am demanding for the new generation in our industry.

Summing up, he says: 'The relatively high incidence of hunches and contacts, as decisive factors in research, emerges as perhaps the highlight of this modest study. These determinants which seem to be independent of formal training; they are not to be found in college curricula. Even application forms do not ask "What is your record in successful hunches?" They are qualities which belong to other than the cognitive side of man.'

PVC Plastisols

'It is often said that the plastics industry, and that of PVC in particular, is a business of cooking and all that is needed is to carry out a large number of trials in order to stumble upon a good recipe which one will then keep secret.' So writes J. Moreaux in *Revue Generale du Caoutchouc*, vol. 37, No. 7-8, July/August 1960, pp. 991-1,000, and goes on: 'We think it possible to do better and that the quality of the plastisol can be improved in a slightly more scientific way without putting too great a strain on the budget...' He goes on to prove this by considering some of the rheological properties of PVC plastisols and their influence on some processes.

The rotating-cylinder viscometer yields useful data, showing, of course, that the plastisols do not behave as Newtonian liquids and the first inflection point, called critical shear stress, is a valuable characteristic, because it expresses mobility or flowability. A high value is wanted for dipping processes to prevent the plastisol running into 'tears' or blisters, but for coating, too high a critical shear stress will prevent the surface from smoothing out and give rise to streaks. For rotary moulding, where the plastisol is required to flow easily, a zero critical stress is desirable.

The viscometer can also indicate whether the plastisol is thixotropic or dilatant. The latter property is very undesirable in a coating process where the plastisol is spread with a doctor blade.

Stiffness of plastisols can be modified in several ways, for example by blending polymers, by studying the plasticizer system, by the use of extenders, fillers, and stabilizers.

Damping Measurement

I have left myself little space for another dip into the bag but I know that everyone interested in the dynamic damping properties of high polymers will wish to read the paper by Roelig and Schmahl, of Farbenfabriken Bayer, of Leverkusen entitled 'Further Development of a Testing Machine for the Determination of the Damping Properties of Polymers.' It appears in *Kautschuk und Gummi*, vol. 13, No. 8, August 1960, pp. WT 221-8. Roelig's original machine is well-known and here is described its latest improvements aimed at small samples, direct reading of the angle of loss without plotting and geometrical measuring, higher accuracy, independent reading of creep, etc. The paper includes excellent diagrams of the new machine and a detailed discussion of its methods of operation and the degree of accuracy of the results.

CHARLES JENNINGS

MEN and MATTERS

A Review of People and Events

AN enthusiastic reception greeted the Queen Mother when she visited the Castle Mills, Edinburgh, factories of North British Rubber early this month.

Her Majesty was welcomed by Lord Provost J. Greig Dunbar who presented Foster M. Stewart, managing director. During her 70-minute tour she visited the new hose factory opened a year ago and reckoned to be the most modern of its kind in Europe. She was particularly intrigued with the manufacture of wire braided hose, as well as giant oil and rotary drill hose, and interested to learn from Mr Stewart that 50% of the output of the new factory was exported. Before leaving the hose factory the Queen Mother chatted to a group of 120 retired employees with service totalling over 4,000 years.

Curing Giants

In the tyre works she saw the final stages in the curing of giant US Royal tyres. The party visited the works canteen and complimented the management on the bright surroundings and cafeteria services available.

The tour concluded with a visit to the main offices where Her Majesty saw framed records of previous royal visits. She signed a parchment which together with the signatures of the party in attendance that day will take its place in the company records.

Safety Posters

Distillers recently held their annual safety poster competition. The competition, whose subject this year was 'better housekeeping,' was open to 12,000 employees. First prize was won by T. Dunn, a senior technical assistant at the DCL chemical division, Carshalton, and second prize by S. G. Jones, who is employed by British Resin Products in their main stores department at Barry.

This competition is playing a good part in spreading the idea of industrial safety not only through the company but through many other organizations — a considerable number of requests were received from abroad for last year's winning posters.

Printing for Fingers

After several years of research and experiment, the Royal National Institute for the Blind has perfected a method of printing braille which uses solid PVC dots. Because the dots are uncrushable and can be printed on thinner paper — reducing by almost one half the bulk of a braille volume — finger-tip readers will find this system a considerable improvement

by Peter Richards

on the conventional printing method. The new process will also substantially reduce the cost of embossed volumes.

The method consists, briefly, of the baking of a solid dot of plastic ink on to the surface of a thin but strong paper. One of the problems that had to be overcome was that the PVC paste used as ink has a gelling temperature near the flash point of the paper. Also, to preserve the uniformity of the dots, essential to the sense of touch, the drops of PVC have to be gelled almost instantaneously. Eventually the problem was solved, in conjunction with GEC, by using infra-red sheathed wire heating panels mounted horizontally one above the other to heat the paper which passes between them.

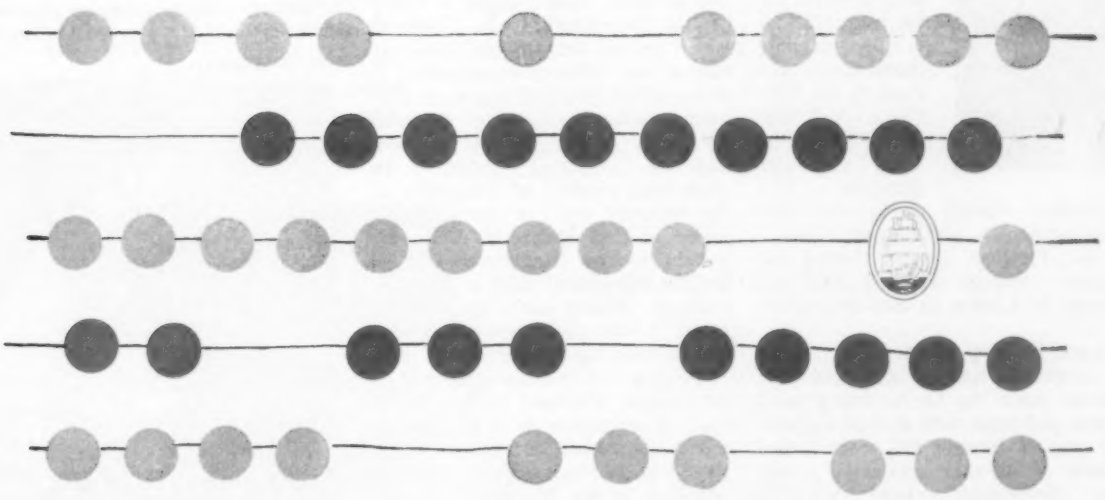
Yarsley Changes

A number of organizational changes have been made in the Yarsley Research Organization. These changes, the company says, 'reflect a broadening of the basis of the company's operations and provide for expansion of its services in the plastics and related fields.'

Industrial and Commercial Finance Corp. Ltd. have acquired an interest in Yarsley Research Laboratories Ltd. and nominated W. Toft to the board. W. Flavell and G. C. Ives have also been appointed directors and the composition of the board is now: V. E. Yarsley (chairman and managing director); C. Webber (vice-

At the beginning of her tour of production departments of North British (see first story) the Queen Mother met the directors. In the top picture she is shaking hands with Ralph D. Hunt, deputy managing director. With Her Majesty is Foster M. Stewart, managing director. Other directors in the group are Alexander Johnston, J.P., Sir William Wallace, T. A. Clayton and F. E. Bray. In the second picture, the Queen Mother, with Mr Stewart, is watching the wire-winding operation in the manufacture of rotary drill hose in the new hose factory at Castle Mills

beads you can count on...



Stearic acid—a ton at a time! . . . child's play to move and handle in the form of Stearex Beads. Packed by Price's especially for the rubber industry in standard size non-returnable bags, a ton of Stearex Beads loaded on a pallet takes only seconds to offload and run into store.

And at no extra cost over other Stearic acid forms, Stearex Beads (made by Price's for Columbian International) offer these extra advantages:—

FREE FLOWING—ideal for handling by manual or pneumatic methods

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chairman); W. Flavell; G. C. Ives and W. Toft.

Yarsley Testing Laboratories Ltd. has become a wholly owned subsidiary of the parent company.

Cyanamid Appointment

John L. Fletcher has been appointed manager of the general chemicals division, Cyanamid of Great Britain Ltd. Mr Fletcher, who was previously connected with plastics, will be responsible for the bulk sales of Cyanamid's chemical products in the UK. These will include, in the New Year, the sales direction for melamine crystal production from the company's new Gosport plant.

Mr Fletcher is now visiting the parent company in USA and will return to London in mid-December.

Games for Top People

In this day and age more and more games seem to be becoming hard work, and some work at least a matter of play. I thought this when I read about a one-week residential course on 'management strategy,' which is to be held at the Sundridge Park management centre in Bromley, Kent, from December 11-16.

The course — intended for directors and senior executives — takes the form of a 'business game' based on the latest American techniques and is intended to give participants experience in making high level decisions affecting the operations of a complete business enterprise. Real life situations are simulated and decisions have to be taken on such matters as market research.

By Popular Demand

The advertising course for senior executives organized last May by the Federation of British Rubber and Allied Manufacturers proved so successful that a second course is being held on December 5 to 6. This will be on similar lines to the first conference but rather more attention is to be paid to questions connected with selling rubber components to other industries; as distinct, that is, from sales of consumer goods. An astonishing number of companies in the industry are, in our opinion, pretty clueless about this very important business of advertising, which has far more to it than is generally realized. Hiding one's light under a bushel is not really sensible, especially in these highly competitive days.

There is still time for companies in the industry who have not yet nominated an executive or a director to attend the course, to do so. They should get in touch with the FBRAM secretary before November 24 (43 Bedford Square, London, W.C.1, MUSeum 2671).

Bank Bridge Director

Norman Bowers, who has been works manager of the Bank Bridge Rubber Co. for several years, has now been made a director of the company.

Aged 37, Mr Bowers has been an associate of the Institution of the Rubber Industry since 1945. He began his career with the Glossop firm Volcrepe, moving to St. Helens Cable and Rubber and then Aerialite before joining Bank Bridge.

* * *

Dr James Craik, chairman of the Nobel division of Imperial Chemicals Industries since 1955, is to retire on March 31 1961. Dr John M. Holm, at present a joint managing-director of the division, will succeed Dr Craik.

WELL DESIGNED

Nancy Schoonover is America's first fully fledged tyre designer. A graduate of Smith College, she joined B. F. Goodrich in 1957 and specializes in small aircraft tyres

Question Corner — 144

(Second Series)

469. Give some details of the use of silicone varnished glass fabric and tape as flexible insulation.

(Answer next week)

Answer to Question Corner — 143

468. High density means that a larger percentage of molecules are packed in an orderly manner and the volume of amorphous areas is comparatively small.

There are three ranges of densities generally recognized: low density 0.910 to 0.925; medium density 0.926 to 0.941 and high density 0.942 to 0.965.

The higher the density of polythene the higher the heat softening point, resistance to gas and liquid permeability, film clarity, gloss and the greater the stiffness. On the other hand the flexibility and impact strength is somewhat lower.

An increase in the average molecular weight may make the resin more suitable for specific packaging applications which require toughness, and a polythene with a high molecular weight will have better resistance to environmental cracking. This type is useful for the manufacture of carboys and transport containers.

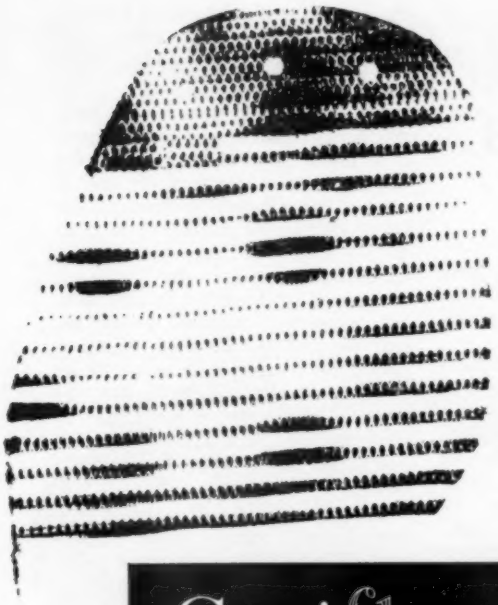
Alternatively, polythenes of low molecular weight are used for such purposes as injection moulding at low temperatures and fast cycle times.

Polythenes with a narrow molecular weight distribution are superior in resistance to environmental stress cracking and to brittleness at low temperatures.

(Another question next week)

Polly Ester Says . . .

'Vent? — Thattaway'



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Pressure sensitive tape
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AMERICAN LETTER

News of the US Rubber and Plastics Industries

from Norman L. Hewitt

THE increasing preoccupation of government with the health of its citizens is a hallmark of much modern political philosophy. One American manifestation of this trend was the formation of the Department of Health, Education and Welfare, and its various subdivisions, including the Food and Drug Administration. It was in 1958 that this latter group, acting on the supposition that the toxic effects of technological progress on American digestive systems might outweigh the standard-of-living refinements, introduced an amendment to the Food, Drug and Cosmetic Act.

Known as the Food Additives Amendment, this law requires that manufacturers furnish proof that any food additive or material which contacts food is non-toxic. Unfortunately, the FDA did not provide instructions for acceptable test procedures, and this lack of direction has been especially hampering to rubber and plastic manufacturers. One reason for this is the industry's position as an eddy at one side of the main stream of food production. After all, the FDA is primarily concerned with materials *added* to food, and polymers are certainly beyond this category. One is tempted to say that, excluding those trying moments when Johnny swallows his chewing gum, rubber and plastics compounds are never eaten.

(Of course there is an exception, and the one which proves this rule is interesting enough to describe here. During the processing of flour and sugar, the ground material is sifted through vibrating wire screens, and to assist in this action small rubber balls are added to the powder. Within eight days, these 'sifter balls' disintegrate, and become a part of the finished flour or sugar.)

What, then, is the relation of rubber and plastic products to public law 85-929? In most cases, it is a matter of migration or extraction. Will any part of the compound become a part of the foodstuff? During the processing of foods, migration of compounding ingredients can occur from such items as tank linings, seals, gaskets, hose, containers, or conveyor belts. Finished food products may absorb ingredients from adhesives used in packages or from the plastic packaging materials themselves.

In all of these cases, one is concerned with very small amounts — concentrations in parts per million — and the question of how to measure becomes as important as toxicity itself. Yet, there is not now available a generally accepted method of analysis. This is perhaps the main cause of the confused and aimless response of the polymer industry to the Food Additives Amendment.

At the outset, the FDA advised the Rubber Manufacturers' Association that any test method must show that either (a) no substance can be extracted from the rubber compound under test conditions simulating food service, or (b) the substance or substances extracted from the compound under test conditions must be identified and determined to be harmless to the health of man or beast. Extraction techniques involved differences in time, temperature and medium. Among many media used are broth, vegetable oils and aqueous solutions of salt, citric acid and sugar. The extractions must be followed by analysis for the ingredients extracted.

One of the largest companies (B. F. Goodrich) proceeded to set up a special group in 1959 to develop suitable test methods. Working in the existing industrial hygiene and toxicology department, they used the elaborate techniques of radio-tracer chemistry, electron microscopy, gas chromatography and the mass spectrometer.

BFG researchers have found it quite difficult to locate the extracted material. The available quantities of the 'leached out' material are never more than minute, and even the liberal use of such refined analytical equipment does not always overcome the extreme difficulty of analyzing the trace quantities involved. The laboratory studies have shown that the migration is primarily a leaching process, usually an interchange between a liquid food phase and the rubber or plastic.

Primary method used by the BFG group, expressed in very simple terms, is to place the rubber sample in the test broth in a standard jar and to subject the solution to temperatures up to 200°F. for periods of time up to 30 days. At the end of this conditioning period the broth is evaporated to dryness. In this state, any extracted material crystallizes, and the crystals are then examined under the electron microscope to see exactly what they look like, to measure their particle size, and to note the shape of the particles to pinpoint the identity of the material extracted.

A modification of the method is to prepare the sample with suspect material which has been made radioactive. These samples are run through the broth heating procedure at similar times and temperatures as above. The resulting broth liquid is then tested for radioactivity rather than being evaporated. The liquid's radioactivity measurement will determine how much, if any, of the radioactive compounding ingredient leached out as a potential food additive. Reports from recent RMA-FDA meetings would seem to indicate that tests based on these BFG as used for the past year, would be very seriously considered for universal adoption as industry standard methods.

In another case, the Syracuse Rubber Co. attempted to develop a technique of locating benzothiazyl disulphide in Mazola corn oil. Amounts of 1ppm were not discernible by infra-red spectroscopy.

The Food Additives Amendment became law in 1958. The dead-line for compliance was March 6 1960. Prior to this date, the FDA issued several extensions in the form of white papers which contained lists of chemicals whose use was sanctioned until March 6 1961 in specific products such as chewing gum, adhesives and packaging. It was not until this September that a white paper extension for compounding ingredients in rubber products appeared. The list included natural rubber, SBR, neoprene, nitrile, butyl and silicone elastomers as well as most common accelerators, antioxidants, activators, retarders, plasticizers, fillers and colours. A significant omission was furnace carbon black; only the channel type was approved. All of these materials are soon to be evaluated through the Tentative Test Methods Specification developed by the RMA

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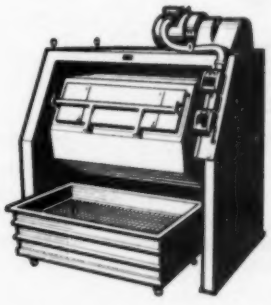

Sub-zero tumblers are available from Columbian International (Great Britain) Ltd., 116 Cannon Street, London E.C.4.

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TUES. NOV. 29—FRI. DEC. 2, 1960

Tues. 11 a.m.-6.30 p.m., Weds. and Thurs., 10-6.30, Fri. 10-4.30

Organised by "Corrosion Technology", a Leonard Hill Journal

£600 million a year—almost as much as it costs to run the National Health Service—that is the cost of corrosion to British Industry. Often hidden and unseen, corrosion constantly menaces plant, machinery, buildings, installations and products. The curse of corrosion can be lifted from your business by taking intelligent and timely preventive measures. See the products that will safeguard your profits; meet the experts dedicated to rescuing your business from rust, corrosion and waste; find the practical ways to defeat corrosion at the Corrosion and Metal Finishing Exhibition.

IMPORTANT TECHNICAL MEETINGS

November 29—Plastics Institute meeting on anti-corrosion plastics. Visitors welcome.

December 1—Corrosion Group of the Society of Chemical Industry discussion on the effects of water movement on corrosion. Visitors welcome.

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Important technical films on anti-corrosion and metal finishing methods, techniques and products will be shown.

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sub-committee on food additives. This is being carried out by a few member companies, and it is not known when the results will be revealed.

This is, of course, only a partial reprieve; the need for a clear course of action remains.

Polyvinyl Dichloride

Hi-temp Geon is the name given by B. F. Goodrich Chemical Co. to their new polyvinyl dichloride. This new plastic will withstand temperatures 60°F. higher than will regular PVC, and this fact has led to a strong advertising campaign centred on household hot-water plumbing. Pipe fabricated from the pilot plant produced resin falls in the same price range as copper plumbing. Thus we now have another step taken on the path that the plastics industry is hopefully pacing out in its determined effort to reach the immense markets of construction.

For the moment, there is more interest in the new material's origin than in its performance, and the company is just as reticent on the former as it is voluble on the latter. 'Polyvinyl dichloride' could be made either by highly chlorinating polythene or by polymerizing ethylene dichloride. However, a third process — chlorination of polyvinyl chloride — has recently been revealed in Australian Patent application 52,593/59, and this seems the most likely solution to the mystery.

ACS Rubber Division Meeting

During the week September 11, the rubber division of the American Chemical Society held its bi-annual meeting at the Hotel Commodore in New York. The ballroom of this well-known member of the Grand Central Station group of hotels has long been the preferred location for rubber division meetings. Thus it was that many rubber technologists and chemists were somewhat disconcerted upon arriving at the usual scene of technical presentations to find themselves in the midst of a Women-for-Kennedy political rally, graced by the presence of the now successful candidate himself.

Perhaps the fact that few chose to listen to Mr Kennedy's views on the state of the GOP in preference to those of Professor Morton on the state of anionic polymerization could have been taken as a clear indication to Professor Morton that his talent should be applied to the political arena. Anyone who has had the pleasure of seeing the Akron University Professor in action would certainly wish to find the equal of his felicitous s t y l e and stimulating delivery in the political harangues of a presidential election.

Notwithstanding the dislocation, a large number of registrants heard a total of 28 papers including series on reinforcement, new polymers and polymerization, general compounding, and testing procedures. Among the more interesting contributions was 'A Study of First and Second Order Transition in Neoprene' by Murray and Deterber of the du Pont Company's Elastomer Laboratory in Wilmington, Delaware.

This paper was refreshing for the clarity with which it defined the two types of low temperature behaviour of neoprene, and for the introduction of a new explanation of plasticizer action in respect to crystallization. Three test methods were used to detect first order transition (crystallization): volume decrease, Shore A hardness increase, and the onset of 90% compression set. Second order transition (glass or brittle temperature) was determined with torsional stiffness and impact tests. Both long term (crystallization) and short term (glass) behaviour were related to changes in state of cure, type of neoprene, sulphur content, and type of filler and plasticizer.

Although butyl oleate has been found to be the most effective of all plasticizers in reducing brittle and short-term stiffness temperatures in neoprene, its effect on long-term (crystallization) stiffening is just the reverse. Compounds containing this plasticizer, when held for several days at a low temperature (*e.g.* — 10°F.) stiffen much faster than those compounds plasticized by petroleum oils or resins. Formerly this phenomenon was explained by plasticizer incompatibility. But since this difference in stiffening rate does *not* occur among different plasticizers in the crystallization resistant WRT type of neoprene, it is apparent that the plasticizer's effect on crystallization is an important consideration. What favours crystallization? Ease of molecular rearrangement. Therefore, the more efficient the plasticizer in facilitating freedom of molecular movement, the greater will be its accelerating of crystallization. Since butyl oleate is the most efficient of all plasticizers, it must also be the fastest producer of crystallization stiffening.

The practical lesson from all this is that good low temperature flexibility in combination with resistance to long-term stiffening can be obtained from a WRT neoprene plasticized with butyl oleate.

Part of what the US *Factory Magazine* called Dayco's 'truly significant plant': view of the powder compounding area showing operator riding on electrically driven platform weighing powders into tote bins (See 'Profit and Loss')

Profit and Loss

Third quarter financial reports from the rubber industry all told very much the same story. S a l e s were slightly up; profits were definitely lower. However, there are two cases which extend beyond the limits of the general average, one in a positive direction, the other a surprising negative.

Mohawk Rubber is one of the select few who anticipate an increase in earnings for 1960. President H. M. Fawcett predicted that the end of the year would see earnings of $2.50-2.60 per share (or a total of $1¼m.) from sales of $32m. to $33m. Last year's corresponding figures were $2.48 per share, $1.22m. earnings and $31.7m. sales. As a producer of replacement tyres, tread rubber (camelback) and repair materials, Mohawk has made impressive gains over the past few years.

In the dark side of the financial

picture, one is amazed to find Dayton Tire and Rubber (now Dayco Corp.). For the first time in over 20 years, this highly esteemed company has failed to pay the regular 35 cents quarterly dividend on common stock. They report a net loss of over $2.5m. for the first nine months of 1960. An explanation to stockholders by President Clowes Christy named a decline in tyre and foam rubber prices, rising costs of labour and materials, and unexpectedly high start-up costs at the new Springfield, Missouri plant as major factors in the large write-off. The first two items have been the common lot of a number of companies in the same field as Dayco.

It would thus seem that the chief source of trouble is in the new factory. In the six months' report of last June, it was noted that labour training at Springfield had required a much longer period than was anticipated. But in the same report, a quotation taken from McGraw-Hill's *Factory Magazine* described the new plant as 'A masterpiece of plant layout and material handling,' and went on to say that 'Dayco Corporation's new Springday Co. plant quickly became the world's top producer of V-Belts. Exceptional expandability, virtually dustless carbon-black handling, and minimum manpower warehousing make this a truly significant plant.'

A source close to Dayco reveals that several changes in key technical personnel have occurred in the past two years. One can only surmise that the planned date for attaining profitable operation was arbitrarily made more than a little too demanding and optimistic.

London Port Charges Increase

Increases in Port of London rates and charges are to be made as from November 21. The PLA will increase the surcharge on rates for dues and rent on vessels using their docks and also mooring dues to 27½% from 22½%. River tonnage dues will go up by 10%, while the surcharge on rates and charges for the use of dry docks and appliances will be increased to 15% from 10%. The surcharges on rates and charges on import goods and goods for shipment will both go up by 10%, as will the surcharges on rates for rent on both import and export goods. Similar increases have been announced by the public wharfingers.

British Xylonite Move

The British Xylonite Group comprised of BX Plastics Ltd., Halex, Cascelloid, Scintillex, Expanded Rubber Co. Ltd., Expanded Plastics Ltd., and Onazote Insulation Co. Ltd., moved from 9 Conduit Street, W.1, on Monday of this week. The group's new West End offices with showrooms for Cascelloid and Scintillex are now at 27 Blandford Street, London, W.1. Telephone No. WELbeck 9211. The main Halex showroom will be situated at Highams Park.

Rubber Statistics

WEST GERMANY — MALAYA

WEST GERMANY'S rubber tyre production in September rose further to 20,849 tons, the Federal Bureau of Statistics has announced.

This compared with 19,193 tons during August, and brought the total for the first nine months of this year to 172,380 tons compared with 147,442 tons (without the Saar Region) in the January to September period of last year.

Output of other hard and soft rubber goods during September rose to 24,065 tons from 23,037 tons in August and to 210,486 tons in the first nine months of this year against 172,793 tons (without the Saar Region) in the corresponding period of last year.

Imports of natural rubber and rubber sole crepe in the first eight months of this year totalled 96,681 tons including 56,528 tons from Malaya, 8,412 tons from Nigeria, 7,680 tons from Thailand, 6,657 tons from South Vietnam, 5,458 tons from Indonesia, and 5,093 tons from Ceylon. The Congo sent another 160 tons of rubber during August, making total deliveries this year 2,480 tons.

Imports of synthetic rubber during the first eight months of this year amounted to 33,515 tons (provisional), including 23,109 tons from the US, 4,574 tons from Canada, 2,347 tons from Italy and 2,008 tons from France.

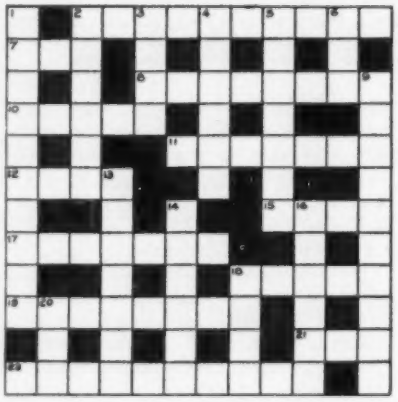
Malaya

Foreign imports of rubber into Singapore and Malaya during October were 37,415 tons, according to preliminary figures.

This total includes 17,213 tons imported on provisional permits in previous months for which final documents have been received, and excludes about 17,640 tons imported during the month for which final documents have not been received.

The comparative figures for September were respectively 31,277 tons, 14,996 tons and 11,905 tons.

RJIP CROSSWORD



CROSSWORD No. 74

CLUES ACROSS

2.—Combined with formaldehyde forms a resin useful in tyre cord adhesion. (10)
7.—An abbreviated honour. (3)
8.—Walking. (8)
10.—Business form of the first part of 8 across. (5)
11.—Stronghold. (7)
12.—Punishing stick sometimes associated with sugar. (4)
15.—BLE at the end can. (4)
17.—Summer pastime includes a unit of electricity. (7)
18.—Have ten again first and come in. (5)
19.—I'd own war doesn't pay and includes a trend in this direction. (8)
21.—Turn the shelter round for a fish. (3)
22.—And a Shropshire town to boot. (10)

CLUES DOWN

1.—Latex coagulant. (6, 4)
2.—Stay for the principal part at the end. (6)
3.—Ties again for position. (4)
4.—Back the deer to it and change it again. (2-4)
5.—An American state is a country first. (7)
6.—Possess a town at last. (3)
9.—The log backed up to the lion's den with another lure gives a precious law (Matt. vii, 12). (6, 4)
13.—Take me back, Father, the Spanish enrol a jury. (7)
14.—The pin, Ian, may cause the wounded to feel like this. (2, 4)
16.—It takes the willow and another net to fasten down the hatches. (6)
18.—Change the tide. (4)
20.—For good or evil the crude metal is included. (3)

(Solution appears on page 876)

put a brake on wear

with CELLOBOND Rubber Reinforcing Resins

Cellobond Rubber Compounding Resins give rubber soles and heels outstanding resistance to wear—despite the roughest treatment—and are specially useful in the direct vulcanization process. They give increased hardness and stiffness, long flex-life and excellent surface finish—and also reduce the tendency to spread. In the manufacture of children's shoes particularly, Cellobond Rubber Resins improve mould flow and bond strength, and assist vulcanization.
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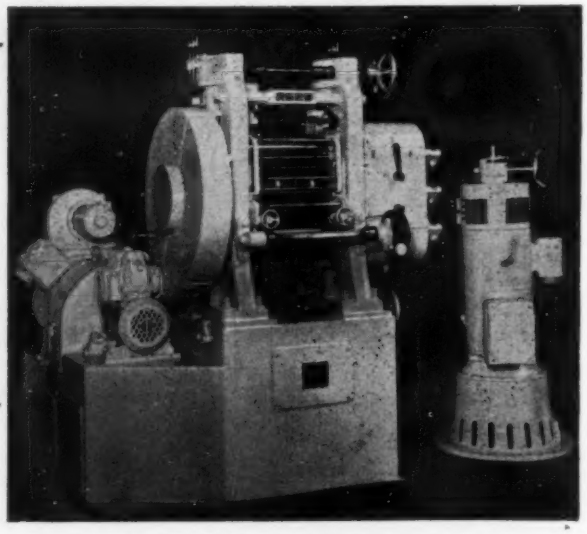
REED FOR CALENDERS



The Calender illustrated is one of the smallest of the range, being a 13" x 6" Even and Friction Speed Calender with variable speed drive for experimental work.

Enquiries solicited for Calenders of all types and sizes.

REED BROTHERS
(ENGINEERING) LIMITED

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PATENT SPECIFICATIONS

The following information is prepared from published Patent Specifications by permission of the Controller of H.M. Stationery Office. The full Specifications can be obtained from the Patent Office, 25 Southampton Buildings, W.C.2, at 3s. 6d. per copy (including postage).

Ethylene-Butene Copolymers

No. 847,706. Esso Research and Engineering Co. Application and Filed, March 12 1958. Application in USA, April 17 1957. Published, September 14 1960.

A modified polythene plastic is made by copolymerizing a mixture of ethylene and 0.2 to 10% of butene-1 with a Ziegler polymerization catalyst. The presence of the butene increases the flexibility of the product. For example, at −50°C., an ethylene-butene copolymer containing 2% of butene has the same order of flexibility as polythene and polypropylene, of comparable tensile strength, have at room temperature.

By suitable variations of reactor temperature and catalyst concentration, it is possible to vary the molecular weight of the copolymer from 50,000 to 1,000,000 or more. Particularly good combinations of processability, strength and flexibility are obtained in the 100,000 to 500,000 molecular weight range. By contrast, the analogous ethylene-propylene copolymers are considerably more rigid at comparable tensile strengths.

Polymerization of Propylene

No. 848,285. Hercules Powder Co. Application and Filed, May 27 1958. Application in USA, May 27 1957. Published, September 14 1960.

The invention relates to a new type of catalyst system for the polymerization of propylene under relatively mild conditions of temperature and pressure. Propylene is contacted with either (a) a freshly exposed surface of a finely divided metal of Group 4B or 5B of the Periodic Table in the presence of a halogen, a hydrogen halide or a halide of one of the above metals, or (b) a hydride of a metal of Group 4B of the Periodic Table in the presence of a hydrogen halide. Both crystalline and amorphous polypropylenes of high molecular weight may be obtained by polymerization of propylene with these catalyst systems.

Gum Plastics

No. 850,458. United States Rubber Co. Application and Filed, December 31 1958. Application in USA, February 14 1958. Published, October 5 1960.

A transparent plastic mixture of the kind sometimes referred to as a 'gum plastic' comprises a major proportion of a transparent resinous material (R) and a minor proportion of a transparent graft polymer (G). The component R is polymethyl methacrylate or a copolymer of methyl methacrylate and styrene containing at least 40% of polymerized methyl methacrylate. The component G is made by the emulsion polymerization of methyl methacrylate or styrene, or a mixture of these monomers, in a latex of polybutadiene or a rubbery copolymer of butadiene with a monoolefin, the copolymer containing at least 60% of butadiene. The proportions of G and R are such that the polybutadiene or butadiene copolymer part of G constitutes 15 to 35% of the total mixture of G and R.

The compositions are hard, tough mixtures having a high impact strength and a transmission of at least 50% of incident light of about 7,000 Angstrom units wavelength through a layer 1/16 inch thick. Data are given for the impact strength, Rockwell hardness and light transmission of about 100 plastic mixtures made according to the invention.

Shorter Abstracts

Production of Rubber Rings. 844,844. George Angus and Co.—A rubber blank is rolled in an annular space between a relatively reciprocating coaxial mandrel and surrounding cylinder to produce a circular ring of uniform circular cross section.

Waterproofing Fabrics. 845,651. Imperial Chemical Industries Ltd. Filed, February 6 1959.—Process for improving the water repellancy of fibrous materials using a methyl polysiloxane fluid and a metal octoate catalyst.

Butyl Rubber Composition. 836,716. The Firestone Tyre and Rubber Co. Filed, August 8 1956.—A rubber composition particularly adapted for use in tyre side walls comprises 70 to 90 parts of butyl rubber, 30 to 10 parts of chlorosulphonated polythene and 105 to 130 parts of reinforcing filler per 100 parts of the blend of polymers. The filler comprises 15 to 40 parts of zinc oxide, 20 to 47 parts of titanium dioxide and 30 to 50 parts of silicon dioxide.

BOOK REVIEW

CABMA REGISTER 1960-61. Eighth edition. (London: jointly by Kelly's Directories Ltd. and Iliffe and Sons Ltd., for the Canadian Association of British Manufacturers and Agencies. Price 15s.)

Lord Rootes, C.B.E., chairman of the dollar exports council, in his foreword, says 'It is a gratifying fact that since the first CABMA Register appeared, eight editions ago, Britain's exports to Canada have increased by some 60%. Last year was a record and British goods earned $580m. in Canada, an increase of 10% on 1958. . . . As in the past, this Register has an important part to play in this task.'

The register has been published annually since 1953 for the Canadian Association of British Manufacturers whose object is to develop an ever greater market for British goods in Canada and so stimulate the two-way flow of trade between the two countries.

The classified list of products consists of more than 3,000 British products available to the Canadian market, with their suppliers given under each heading. The French equivalents of these headings are set out in alphabetical order in a separate glossary. A directory of nearly 4,000 British firms gives details of their distribution arrangements in Canada. Proprietary names and trade marks are given in special sections which enable the Canadian buyer to identify products and their sources of supply. The six sections of the Register are identified by a slotted index and tinted paper.

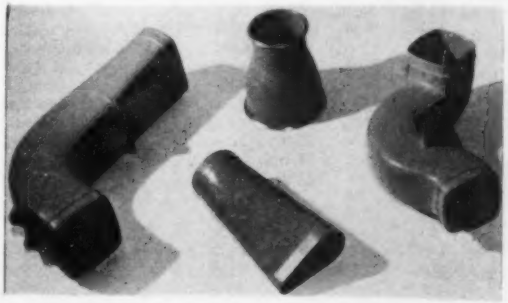
∴ Copies may be ordered through the Books Department, RUBBER JOURNAL AND INTERNATIONAL PLASTICS, Maclaren House, 131 Great Suffolk Street, London, S.E.1.

Company in the News

Columbian Carbon

Columbian Carbon Co. achieved record sales and earnings in the nine months' period ended September 30 1960, despite a comparatively unfavourable third quarter.

According to an interim report to share-owners this month, consolidated sales for the nine months' period ended September 30 increased 10% to $60,895,000 from the $55,264,000 volume in the 1959 period.



Fothergill and Harvey's Tyglas cloth was used to reinforce this plastic ducting manufactured by C. F. Taylor (Plastics) Ltd., of Crowthorne, Berks. It is used in the Vickers Vanguard air circulation system and was exhibited recently at Farnborough

Rubber and Plastics Stock Market

A REVIEW OF PRICES AND TRENDS

THE tempo has slackened to slow waltz time in the Stock Market over the past few weeks. Shares have passed through one of the quietest trading accounts so far this year. Buyers generally have held back because of the news from the big industries now feeling the full effects of the credit squeeze. Caution has continued to be the key note to investment outlook. And the forecast of many is that there will be little change in overall prices. So far Mr Kennedy's win in the American Presidential Elections has had only a minor effect on sentiment. But if his policies once they get under way do result in another round of inflation as many people think they will, some of the beneficial backwash will be felt here in London. But this, of course, is looking a long way ahead. Meantime, company news items continue to play the dominant role in domestic affairs.

A classic example of this was the half-time results and statement from the mighty COURTAULDS man-made fibre group which, when digested, gave the market a good old-fashioned belly-ache. It was revealed that the group's six month profits had improved from £5,118,000 to £5,370,000. The 1959 figures, however, did not include profits of the PINCHIN JOHNSON paint firm, which were £447,000 after £464,000 tax. Shareholders were told that the pattern of profits in the first half of the current year was with certain exceptions similar to that of the first half of 1959-60. But trading conditions in North America have become even more competitive and business unremunerative. As far as could be foreseen it was anticipated that the group profits for the year including results for Pinchin may not reach last year's total of £21m. The interim dividend has been raised from an equivalent of 9d. to 10d. on the larger capital.

From DE LA RUE came news that although profits for the 28 weeks ended October 15 improved compared with the corresponding period last year, they were a little lower than expected. The balance before tax was £944,000 against £893,000. An interim of 9d. was declared and a final of 1s. 6d. foreshadowed, making 2s. 3d. a share on capital increased by share bonus. This is in line with the forecast at the time of the issue. Profits did not come up to expectations principally due to a temporary decline in demand in the UK market for Formica. On the other hand the company's investment interest in this field abroad are, with the exception of the German company still in the early stages of development, doing well and capital investment is continuing as planned throughout the

Continued on page 871

Share Price Movements

Par Value	Company	1960 High	Low	Nov. 5	Latest
£1	A.E. Ind. Ord.	67/–	42/–	47/9	43/3
5/-	Albright & W. Ord. ..	34/3	25/9	27/9	27/–
£1	„ „ „ 5% Pref.	17/3	15/6	15/3	15/6
5/-	Anchor Chemical Ord...	18/7½	14/9	16/–	16/–
5/-	Andersons Rub. Ord. ..	—	—	3/9	3/9
£1	Angus Geo. Ord. ..	60/6	34/9	60/6	60/–
5/-	Ault & Wiborg Ord. ..	27/3	20/–	26/9	27/–
£1	Avon India Rubber Ord.	46/6	35/–	35/–	35/–
£1	„ „ „ 6% Pref.	20/–	17/6	18/9	19/–
10/-	Bakelite Ord.	62/6	39/9	56/–	46/6xc
£1	„ 6% Pref. ..	19/3	16/9	19/–	18/–
£1	Baker Perkins Ord. ..	46/6	40/–	45/–	45/–
4/-	Bank Bdg. Rubber Ord.	4/3	2/3	2/6	2/6
4/-	Brammer H. Ord. ..	18/6	16/9	18/3	18/1½
10/-	Bridge, David Ord. ..	66/6	53/6	63/9	62/6
5/-	Bright, John Ord. ..	18/6	15/3	16/3	16/3
5/-	Brit. Blting. & Asb. Ord.	—	—	19/6	19/–
£1	„ „ „ Pref.	—	—	17/3	15/9
2/-	Brit. Ind. Plas. Ord. ..	12/1½	5/3	9/4½	9/6
2/-	„ 10% (tax free) Pref.	4/9	4/3	4/9	4/9
£1	British Xylonite Ord. ..	67/–	50/6	108/9	62/6xc
£1	„ „ 5% Pref.	18/9	14/–	14/6	14/6
£1	BICC Ord.	61/3	47/6	49/6	49/3
5/-	BTR Ind. Ord.	17/3	9/9	16/7½	16/9
£1	„ „ 7½% Pref. ..	24/3	21/3	21/3	22/6
5/-	Cole, E. K.	31/9	18/10½	24/9	21/7½
£1	Courtaulds Ord. ..	59/4½	44/3xc	57/–	48/6
£1	„ 5% 1st Pref.	17/9	15/9	15/9	15/9
£1	„ 6% 2nd Pref.	21/–	18/6	18/9	18/9
4/-	Cow, P. B. Ord. ..	9/9	6/9	8/6	8/–
£1	„ „ 5% Pref. ..	15/6	14/–	14/–	14/6
1/-	Dannimac Mfg. Ord. ..	14/6	9/–	14/6	13/6
10/-	De La Rue Ord. ..	78/6	47/9	61/9	58/9
£1	„ „ „ 3½% Pref. ..	12/–	10/–	10/3	10/6
10/-	Distillers Co. Ord. ..	46/–	32/9	43/3	42/9
£1	„ „ 6% Pref...	22/–	19/6	20/–	20/–
£100	„ 5% Conv. Loan	£96	£95	£95	£96
£100	„ 5½% Unsec. Loan	£97	£86½	£87	£87½
10/-	Dunlop Rubber Ord. ..	30/6	21/9	22/9	22/–
£1	„ „ 5½% Pref.	19/–	16/6	16/6	16/6
£100	„ 3½% 1st Debs.	£78	£68	£69	£70
£100	„ 4½% 2nd Debs.	£87	£79	£79½	£79½
£1	Eng. Elect. Ord. ..	53/6	32/–	35/6	32/9
4/-	Ebonite Cont. Ord. ..	14/3	10/9	10/9	10/9
£1	English China Clays Ord.	95/–	69/3	88/6	94/–
£1	Goodyear Tyre 4% Pref.	12/9	10/9	11/6	11/6
5/-	Greeff Chem. Ord. ..	35/–	23/6	25/–	25/6

Par Value	Company	1960 High	Low	Nov. 5	Latest
10/-	Greeff Chem. 5½% Pref.	9/–	8/–	8/–	8/–
5/-	Hackbridge Hldg. ..	8/7½	6/7½	7/3xc	6/9
4/-	Greengate & Irwell Ord.	6/6	5/3	6/3	5/9
£1	Harrisons & Crosfield Dd.	64/–	49/6	52/6	51/3
1/-	Hunt & Moscrop Ord...	2/9	1/6	1/7½	1/6
£1	Imp. Chem. Ord. ..	75/3	54/3	71/3	71/6
£1	„ „ 5% Pref. ..	18/–	16/3	16/3	16/6
£100	„ 4½% Unsec. Loan	£89½	£81	£82½	£82½
£100	„ 5½% Conv. Loan	£212½	£90xc	£92½	£92½
1/-	Kleemann (O. & M.) Ord.	11/6	8/3	10/1½	10/3
£1	„ „ 6½% Pref.	19/–	17/–	17/6	17/6
5/-	Laporte Ind. Ord. ..	33/6	21/3	30/10½	29/–
£1	„ „ 7½% Pref.	24/3	23/3	23/3	23/3
£1	Leyland & Birm. Rubber Ord.	63/–	46/3	52/6	52/6
£1	„ „ „ 6% Pref.	19/–	17/6	18/9	18/9
2/-	London Rubber.. ..	14/9	11/–	13/9	14/–
£1	„ 6% Red. Cum. Pref.	20/–	18/–	18/9	18/–
£1	McKechnie Bros. Ord...	71/6	57/–	65/–	63/1½
£1	„ „ 'A' Ord.	69/3	56/–	64/–	61/3
£1	„ „ 6% Cum. Pref.	18/–	16/–	17/–	17/–
5/-	Monsanto Chem. Ord. ..	31/–	23/–	30/9	29/3
£1	„ „ 3½% Pref.	12/9	12/–	12/6	12/6
£100	„ „ 6% Debs.	£103½	£98	£98	£98
5/-	Miles (H.G.) Holdgs. Ord.	11/3	9/9	10/–	10/–
£1	North British Rubber ..	21/3	16/–	16/3	17/1½
5/-	Northwestern Rubber ..	—	—	12/–	12/–
5/-	Plastic Enginrs. Ord. ..	30/–	20/–	29/–	29/3
5/-	Redfern Holdings Ord...	5/9	3/6	4/–	3/6
2/-	RFD Ltd. Ord.	6/6	3/6	4/–	3/6
£1	„ „ 5½% Pref. ..	14/6	12/9	13/9	13/–
2/-	Rubber Imp. Ord. ..	7/9	3/9	4/–	3/9
2/-	„ „ 'A' Ord. ..	7/–	3/3	3/6	3/3
£1	„ „ 5% 1st Pref.	15/–	11/3	11/10½	12/3
5/-	Rubber Reg. Ord. ..	19/3	17/–	18/6	19/–
4/-	Shaw Francis Ord. ..	27/6	20/–	20/6	20/–
2/-	Silentbloc Ord.	13/3	9/–	9/3	9/1½
5/-	Storey Bros.	41/9	28/3	37/6	37/3
2/-	Sussex Rubber Ord. ..	2/3	1/3	2/–	2/–
5/-	Sutcliffe Speak Ord. ..	15/9	11/–	13/6	13/9
£1	Turner & Newall Ord. ..	60/10½	48/3	55/–	54/–
£1	„ „ „ 7% Pref.	25/–	22/3	22/9	22/9
5/-	Universal Asbestos Ord.	50/–	24/3	25/6	25/–
5/-	Viscose Dev. Ord. ..	16/6	14/9	16/–	16/–
5/-	Warne W. (Holdgs.) Ord.	18/9	14/9	17/6	15/9

Rubber Markets

LONDON

Overall trading remained small and interest in terminal positions was rather more noticeable in distant positions than for near months. The more forward positions were at a premium over nears. Consumer demand was still of a selective character but prices for the most part were fairly steadily held as sellers were reserved.

No. 1 RSS Spot: 26d.-26¼d.

Settlement House:
December 26d.-26¼d.
January/March 26¼d.-26⅜d.
April/June 26⅜d.-26½d.
July/September 26⅜d.-26½d.
October/December 26½d.-26⅝d.

No. 1 RSS cif basis ports:
November unquoted.
December 26d.-26¼d.
January 26d.-26¼d.

Godown:
December 87½ Straits cents nominal.

LATEX

Centrifuged 60% latex per gallon in drums, seller, November, December, 14s. 9d., cif European ports. Spot, seller, 15s. 8d. Bulk, seller, d.w. 14s. 8d. nominal. Creamed, seller, 14s. 6d. nominal, November, December. Normal, seller, November, December, 12s. 10d.

AMSTERDAM

The Amsterdam rubber market ruled as under on November 14:

	Guilders per kilo	
No. 1 RMA	Nov. 14	Previous
November	2.55	2.57
December	2.55	2.57
January	2.56	2.56
February	2.56	2.56
March	2.56	2.56
January/March ..	2.56	2.56

Sales: Nil. Tendency: Easy.

BANGKOK

No. 1 RSS

The price of No. 1 RSS at Bangkok on November 14 was 28.00 (28.00) US cents per lb.

DJAKARTA

No transactions were reported on November 14. Buyers were not prepared to meet the sellers' price of 29.50 to 28.75 rupiahs per kilo of sheet No. 1 for ready delivery. The market closed quiet.

	Rupiahs per kilo	
	Nov. 14	Previous
Spot No. 1 Priok ..	28.25b	29.00b
Spot No. 2 Priok ..	27.00b	27.75b
Spot No. 3 Priok ..	26.00b	26.75b
No. 1 fine pale crepe, spot	31.00b	31.00b

Tone: Quiet.

SINGAPORE

Idle conditions prevailed throughout the morning of November 14. Fluctuations were small and business was at a standstill for much of the time. Interest in lower sheets was sporadic and mostly for switches. Factories were quiet. In the afternoon No. 1 sheet was neglected. Business was mainly confined to No. 2 and 3 RSS. The close was quiet on a limited turnover.

	Malayan cents per lb., fob Malayan ports to open ports	
	Nov. 14	Previous Close
No. 1 RSS, Dec. ..	87⅞–88	88½–88¾
Jan. ..	88⅜–88½	89 –89⅛
No. 2 RSS, Dec. ..	87 –87½	87⅜–88
No. 3 RSS, Dec. ..	85½–86½	86½–87½
No. 4 RSS, Dec. ..	82½–83½	82⅞–83⅞
No. 5 RSS, Dec. ..	77½–78½	77⅞–78⅞
No. 1 RSS, Spot ..	86½–87½	87⅛–87½
No. 3 blanket, thick remilled crepe, Dec.	73½–74½	74½–75½
No. 1 fine pale crepe, Dec.	91 –92	91⅞–92⅞
2X thin brown crepe, Dec.	72½–73	73½–74½

Tone: Very quiet.

The Industries Syndicate quote latex, native produce, 60% centrifugal, packed in rectangular drums, fob at 172.20d. per gallon.

NEW YORK

The New York rubber market ruled as under on November 14:

DEALERS' PRICES

	US cents per lb., ex-dock	
	Nov. 14	Previous
No. 1 RSS, Nov. ..	31⅛a	31⅜a
Dec. ..	31a	31⅛a
No. 2 RSS, Nov. ..	30⅞a	31⅛a
Dec. ..	30⅞a	30⅞a
No. 3 RSS, Nov. ..	30⅝a	31a
Dec. ..	30⅝a	30⅝a
No. 1 RSS, Spot ..	31⅛n	31⅛n
No. 3 amber blanket, crepe, Nov. ..	26⅜n	26⅜n

FUTURES—REX CONTRACT

	Nov. 14	Prev. Close
Nov. ..	31.20t	31.50b–31.85a
Jan. ..	30.65b–30.70a	31.00t
March ..	30.50b–30.55a	30.85t
May ..	30.50t	30.80t
July ..	30.40b–30.55a	30.70b–30.80a
Sept. ..	30.30b–30.45a	30.70b–30.75a
Nov. ..	30.30n	30.70t

Sales: 52. Tone: Easy.

Futures were softer on November 14 on scattered selling in moderate dealings. The decline in foreign markets and slow consumer interest here for physical rubber induced the selling. Physical rubber was quiet and softer.

In late dealings futures were easy on scattered selling. In physical rubber, ribbed sheets were soft while ambers and browns were barely steady. Factory interest was light.

CEYLON

No. 1 RSS

The price of No. 1 RSS at Colombo on November 14 was 90 (92) Ceylon cents per lb.

STOCK MARKET

Continued from page 870

Formica group of companies. The group's order book as a whole remains satisfactory and unless there is any major setback, profits for the year should be about the same as those for last.

At a recent meeting, Mr Stanley Adams, chairman of BAKELITE, reported that turnover for the first nine months of the current year had exceeded that for the corresponding 1959 period. Profits for the same period have been fully maintained. Approval was given to the one-for-five scrip issue and the shares are now being quoted at 46s. 6d. 'ex.'

RUBBER REGENERATING has raised its payment to shareholders by 5% to 22½%. Net profits were shown to have increased from £298,600 to £331,400 after a higher tax bill of £285,000 against £235,000.

Group sales of BRITISH INSULATED CALLENDER'S CABLES in the half-year to June 30 were £11m. higher at £74m. Chairman, Sir William McFadzean, who heads the company, told members that the increased group turnover for the half year is being maintained during the second six months of the year. The interim dividend was held at 4%. Sir William said that on the basis of current trading, indications are that the profit for the whole of 1960 should not differ materially from that of last year.

Bid for Hardman

Borax (Holdings) is making a cash and share exchange offer worth about £2¼m., or 18s. 2d. per 5s. share, for the £750,000 capital of Hardman and Holden, manufacturers of a wide range of chemicals.

Terms of the offer, which is being made through Lazard Brothers and Co., will be two deferred 5s. ordinary units of Borax plus 20s. cash for every three 5s. ordinary units of Hardman and Holden.

The directors intend to recommend acceptance of the offer.

Mr Fordyce Jones

The death occurred on November 14 of Mr Fordyce Jones at the age of 76. Mr Jones, a great figure in the rubber world and something of a pioneer in his own way, completed 50 years in the industry. He retired in 1951 from his position as chairman of the Reliance Rubber Co. Ltd., a company founded by his father in 1886 in small premises in London's Lower Thames Street.

The Reliance Rubber Company was the first firm in this country to manufacture moulded hot-water bottles, a move made in collaboration with T. W. Miller of the Faultless Rubber Co., Ashland, Ohio. By agreement, the name 'Reliance' was used by that company in the USA for hot-water bottles.

LINDSAY AND WILLIAMS LIMITED

Announcement

PLASTIC MOULDINGS AND GLASS FIBRE
FABRICATION ARE NOW IN PRODUCTION
AT MANCHESTER AND BELFAST FACTORIES

*

Your enquiries please for compression and injection products, also continuous runs of glass fibre units to all designs.

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PG 101

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Highly active Additives for Blowing Agents

Additive Paste 1100
Additive Paste 1600

- Improve cell structure
- Enhance blowing action
- Remove disagreeable odour of blowing agent after cure
- Disperse and active white fillers

RHEIN-CHEMIE GmbH, Export Department, Heidelberg

Represented in the U.K. by: **Messrs. Lonabarc Ltd., 110 Cranbrook Road, Ilford, Essex**

Industry INTELLIGENCE

Technical Data

Epoxy Pressure Piping

The Epoch pipe system has been developed to meet the demand for large bore corrosion resistant pressure piping. It comprises pipes and fittings 6in. to 15¼in. bore made from epoxy resin and reinforced with glass fibres. The inner and outer layers are reinforced with acrylic fibre to give increased chemical and abrasion resistance. These pipes are designed for working at pressures up to 600 psi and for continuous operation in three temperature ranges covering the range from 0°C. to 120°C. The manufacture of the pipes is done on an automatic production unit which ensures uniformity and accurate control. The system is described in a booklet reference PLAS.3 obtainable from the Sales Department, Bristol Aeroplane Plastics Ltd., Filton House, Bristol.

Polysar Shoe Soling

Technical reports Nos. 9:9C and 9:10B issued by Polymer (UK) Ltd., Walbrook House, Walbrook, London, E.C.4, describe the use of polysar rubbers for shoe soling applications. Report No. 9:9C describes a Polysar Krynac 803/S/804 stock for use in oil-resistant moulded-on soling. This blend was chosen for oil resistance, processability and abrasion resistance. The compound chosen exhibits good mould flow, cures rapidly and has good bin life. It also produces soles which adhere well to leather uppers and are attractive in appearance.

Report No. 9:10B presents data on the results obtained with a range of fast curing accelerator systems in moulded-on Polysar Krylene sports shoe soling. This rubber has a low Mooney viscosity, it accepts fillers quickly and its compounds have low viscosity, low heat build-up during processing, good scorch safety and excellent mould flow.

BHT Antioxidant

BHT is a non-staining antioxidant of high efficiency for white and pale coloured stocks. It also confers resistance to copper degradation, and at the recommended level of 1-2 phr it is non-blooming. It is non-toxic and can therefore be used safely in contact with foodstuffs. A further use for BHT is as a non-staining stabilizer for styrene-butadiene rubber. The results of bomb ageing, accelerated ageing and copper inhibition tests on stocks containing varying amounts of BHT are listed in laboratory report No. LA3/1 issued by Monsanto Chemicals Ltd., 10-18 Victoria Street, London, S.W.1.

Machines, Materials and Equipment

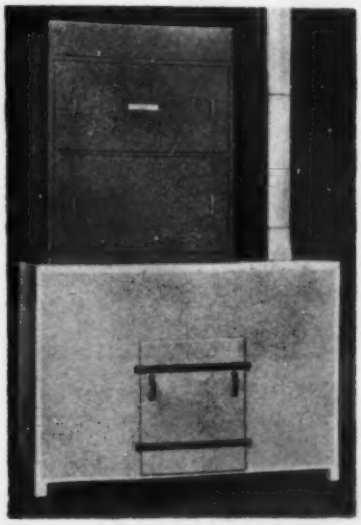
Polythene Ball Valve

The subject of a provisional patent, the latest addition to the range of products by Barflo Ltd., 56 Cavendish Place, Eastbourne, is an all-plastic ball valve.

This unit is made entirely from high density polythene and has an all direction adjustable arm. Designed to withstand the test requirements of BS 1212:1953, the valve is made in ¼in. and ⅜in. BSP sizes for use in high, medium and low pressure applications. It has no metal parts, is light, unbreakable and not subject to corrosion.

Dust Control Units

It is generally conceded that a 4 cu. ft. dust container is the maximum convenient size for manual handling. Bulky or granular materials demand special consideration in the case of unit dust collectors and to deal with problems of this nature the Dallow Lambert Unimaster H type model is available.



This is a conventional dust control unit in the Unimaster range, fitted with an angle flange at the base of the filter chamber; this adaptation allows the unit to be mounted on large storage containers which can be made up from any material such as timber, chip board or sheet metal, always providing they are airtight. The illustration shows a Unimaster 250 H dust control unit mounted on a dust storage container made up from chip board and timber at a very economical figure. The container holds a large quantity of the collected product and a door can be easily fitted for periodic emptying.

The H type units are available in 70, 100, 150 and 250 series (70-250 sq. ft. of filter area) with fan capacities up to 2,000 cfm.

Publications

Polythene Surface Treatment

To render the surface of polythene films receptive to printing inks and adhesives the film may be treated by electric discharge methods or flame treatment methods.

A booklet recently issued by Monsanto Chemicals Ltd., 10-18 Victoria Street, London S.W.1, gives information on electrical discharge treatment of polythene film and is based on a paper presented at the 16th annual technical conference of the SPE in New York in 1959. The Monsanto reference to this technical service bulletin is M4/1 and it is a study of the main variables relating to this method of surface treatment, and of the important effects of slip additives. Other aspects of the method will be dealt with in further publications.

Artrite Polyesters

A booklet on polyester resins for glass fibre moulding issued by Artrite Resins Ltd., Kingsway, London, W.C.2, gives details of the PE 70 series of resins.

These resins are designed to meet the needs of reinforced plastics fabricators and moulders. There are six grades and each is available in five different viscosities depending on the moulding method to be employed. Details are also given in the booklet on the catalysts and hardeners available for cold, warm or hot curing and on the other ancillary additives which may be necessary such as fillers, colour pastes and modifying resins. The various moulding techniques are briefly discussed and an indication is given of the range of physical properties likely to be obtained.

Hatco Plasticizers

Catalogue No. 160 issued by Hatco Chemical Division, Fords, New Jersey, gives details of the performance, properties, structure and uses of the range of plasticizers marketed by the company. These products are divided into four groups: phthalates — general purpose primaries, adipates — low temperature primaries, sebacates — low temperature specialties and fumarates — plasticizing polymer intermediates.

Also included in the booklet are details of testing methods, tabulated form of the plasticizer properties for quick reference and a centigrade/fahrenheit conversion table.

less-common metals and chemical compounds

HIGH PURITY METALS

CALCIUM · CHROMIUM · NIOBIUM · SILICON · TANTALUM · VANADIUM

CHEMICAL COMPOUNDS

* CHROMIUM carbide	NIOBIUM oxide	SILICON nitride
* TITANIUM carbide	TANTALUM oxide	* TANTALUM carbide
* TITANIUM chloride	* TITANIUM iodide	* VANADIUM chloride

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ALL CLASSES OF PROOFING FOR THE GARMENT, MOTOR HOOD & BAG TRADES

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'PHONE: MANSION HOUSE 0781

876 Rubber Journal and International Plastics, November 19 1960

British Standards

PVC Tiles and Flooring

Two new British Standards for PVC (vinyl) asbestos floor tiles and flexible PVC flooring (BS 3260: 1960 and BS 3261:1960) have been issued. Both standards were prepared under the authority of the Plastics Industry Standards Committee and it is required that products said to comply to the specifications shall bear the BSI certification mark.

Each standard specifies materials, colour and finish, dimensions, colour fastness to daylight and resistance to various substances, including tallow, and mineral and vegetable oils. BS 3260, which applies to smooth-surfaced asbestos floor tiles, contains tests for ensuring that the tiles do not break or crack under normal impact and that they withstand heat of up to 100°C. (It is laid down that after a six-hour test in which tiles are kept in ovens heated to 80°C., the change in linear dimensions shall not exceed 0.25%. Another requirement stipulates that after a six-hour test in which tiles are kept in ovens heated to 100°C., the loss of volatile material shall not exceed 1.0%). BS 3261, which applies to smooth surfaced flexible PVC flooring contains tests to ensure flexibility of the flooring.

Copies of these standards may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London, W.1., price 4s. 6d. each. (Postage extra to non-subscribers.)

Calls for Tenders

PVC Pipes

A supply of PVC pipe fittings and accessories is required by the Government of India, India Supply Mission, 2536 Massachusetts Avenue, N.W., Washington 8, D.C., USA, to whom bids should be sent, quoting Tender No. SE 285.

Copies of specifications and other documents can be obtained from the India Store Department, Government Buildings, Bromyard Avenue, Acton, London, W.3. Closing date: January 17 1961. (Ref. ESB/28874/60/DLF.)

Canadian Asbestos

Shipments of asbestos from Canadian mines during September 1960 totalled 105,689 tons, compared with 103,286 tons in the preceding month and with 98,363 tons in September 1959.

For the first nine months, shipments amounted to 809,126 tons, compared to 757,287 tons year ago.

Shipments of all grades by Quebec producers in September 1960 amounted to 101,157 tons and in the first nine months to 759,706 tons. This compares with 92,853 and 713,068 tons respectively year ago.

Shipments to export markets in August totalled 100,510 tons and in the year to date 660,714 tons.

Future Events

Institution of the Rubber Industry

Humberside Section. — Nov. 24 at Hammond's Restaurant, Hull, at 8 p.m. Foundation Lecture of the section, given by Dr L. Mullins (NRPRA) and Dr W. C. Wake (RABRM): 'The Trend of Polymer Development for the Rubber Industry.'

Manchester Section. — Nov. 28 at the Engineer's Club, Albert Square, Manchester, at 6.45 p.m. 'Costing in the Rubber Industry,' by G. P. Slater (Dunlop).

Western Section.—Nov. 23 at 8 p.m. at the Royal York Hotel, Bath. 'Colours — Their Uses and Developments,' by H. G. White (I.C.I.). Joint meeting with Plastics Institute.

Plastics Institute

Western Section. — Joint meeting with IRI Western Section (see above).

Changes of Name

S.I.S. Plastics Ltd. (639,408), 25 Bridge Road, Wembley Park, Middlesex.—Name changed to Resoplastics Ltd. on April 8 1960.

Glass Moulding and Design Co. Ltd. (596,299). Ship builders, shipwrights, manufacturers of and dealers in plastic, etc., 9 Kingsway, W.C.2.—Name changed to Microcell Mouldings Ltd. on March 15, 1960.

Astley Reinforced Plastics Ltd. (626,632), 48 Market Place, Reading.—Name changed to Reading Plastics Ltd. on March 24 1960.

Light Weight Plastics Ltd. (617,251), No. 2 Factory, Goodwin Road, Edmonton, N.9. — Name changed to Lightweight Plastics Ltd. on March 7 1960.

D. Dugdale, Son & Co. (Plastics) Ltd. (652,435), Valley Mill, Sowerby Bridge, Yorks.—Name changed to D. Dugdale, Son & Co. Ltd. on March 31 1960.

Reinforced Structures Ltd. (429,439), 3 Woodside Green, S.E.25.—Name changed to Palmers Reinforced Plastics Ltd. on April 4 1960.

Eastern Surgical Products Ltd. (278,004), Bilbao House, New Broad Street, E.C.2.—Name changed to Lewis Knight and Co. Ltd. on March 11 1960.

Hecht, Levis and Alcan Ltd. (580,109), rubber merchants, etc., 3 Mincing Lane, E.C.3.—Name changed to Hecht, Heyworth and Alcan Ltd. on March 9 1960.

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

DEGUSSA

(803,505) Synthetic resin plastics included in Class 17 in the form of sheets, foils, plates, blocks, rods, tubes or shaped sections; and materials for packing (jointing), stopping and insulation. Deutsche Gold-Und Silber-Scheideanstalt Vormals Roessler, 9 Weissfrauenstrasse, Frankfurt-on-the-Main, Germany. Address for service is c/o Elkington and Fife, Bank Chambers, 329 High Holborn, London, W.C.1. (Class 17; October 12 1960.)

KRIMPON (B799,684) Boots, shoes, slippers and sandals. The Miner Rubber Co. Ltd., 191 Denison Avenue, Granby, Province of Quebec, Canada. Address for service is c/o Reginald W. Barker and Co., 13 Charterhouse Square, London, E.C.1. (Class 25; October 12 1960.)

BEDCOR (802,923) Suitings, being piece goods wholly or substantially wholly of synthetic fibres. Moore, Johnston and Co. Ltd., 154/156 Sunbridge Road, Bradford, County of York. (Class 24; October 12 1960.)

FLEXZONE (802,285) Chemical preparations for use in the manufacture or processing of rubber or synthetic rubber or of latices of rubber or synthetic rubber, for improving their resistance to the effects of light, heat and of oxygen. United States Rubber Co., Rockefeller Center, 1230, Avenue of the Americas, New York, N.Y., USA. Address for service is c/o T. A. Clayton, 62 and 64 Horseferry Road, London, S.W.1. (Class 1; October 26 1960.)

WELVIC (807,510) Plastics in the form of pastes, liquids, emulsions, dispersions, powders, granulates and pellets, all being for industrial use. I.C.I. Ltd., Imperial Chemical House, Millbank, London, S.W.1. (Class 1; October 26 1960.)

A general view across one end of the extrusion shop at Kleeman's Stroud works. The shop covers 50,000 sq. ft. and is one of the biggest profile extrusion centres in Europe. This picture is one of the many illustrations in a new booklet from Kleeman's covering their raw materials and intermediate products

PATENT LIST

Printed copies of the Specifications in the following list, published by permission of the Controller of H.M. Stationary Office, can be obtained from the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d., including postage.

COMPLETE SPECIFICATIONS ACCEPTED

Open to public inspection on August 31 1960

Dunlop Rubber Co. Ltd. Process for the manufacture of coated textile fabrics. 846,548.

Rohm & Haas Co. Spinning of artificial fibres and films. 846,890.

Farbwerke Hoechst Aktiengesellschaft Vorm Meister Lucius & Brüning. Process for the manufacture of polythene. 846,893.

Farbwerke Hoechst Aktiengesellschaft Vorm Meister Lucius & Brüning. Process for dyeing and printing fibres and foils of polyacrylonitrile. 846,562.

Yarsley Research Laboratories Ltd. Epoxide resins. 846,706.

Farbwerke Hoechst Aktiengesellschaft Vorm Meister Lucius & Brüning. Method of strengthening pipes made of polyolefins. 846,707.

Chemstrand Corporation. Polyamide moulding compositions. 846,907.

National Research Development Corporation. Moulding of phenolic and epoxy resins. 846,557.

Columbia-Southern Chemical Corporation. Preparation vulcanizates and vulcanizable mixtures. 846,443.

Bleachers' Association Ltd. Methods for imparting to cellulosic fabrics a drip-dry crease-resistant finish. 846,287.

Esso Research & Engineering Co. Polymerization of olefins. 846,731.

Socfin Co. Ltd. Manufacture of rubber. 846,290.

Super Mold Corporation of California. Band-type retreading mould for tyres. 846,572.

Imperial Chemical Industries Ltd. Polymerizable compositions. 846,485.

Imperial Chemical Industries Ltd. Polymerizable compositions. 846,486.

Victor Manufacturing & Gasket Co. Cork asbestos elastomer sheet. 846,577.

Farbwerke Hoechst Aktiengesellschaft Vorm Meister Lucius & Brüning. Process for dyeing shaped structures of aromatic polyesters, especially of polythene terephthalates. 846,491.

American-Marietta Co. High solids vinyl dispersions and primers therefor. 846,492.

Chemstrand Corporation. Process for union dyeing of acrylonitrile polymer and wool fibre blends. 846,500.

Minnesota Mining & Manufacturing Co. Perfluorohaloolefin latex. 846,501.

Polymer Corporation Ltd. Emulsion polymerization. 846,502.

E. I. du Pont de Nemours & Co. Manufacture of monovinylacetylene. 846,518.

Rohm & Haas Co. Hard, rigid polymeric products of high impact resistance. 846,519.

Phillips Petroleum Co. Bonding of polythene to a rubber base. 846,218.

Union Carbide Corporation. Linear polyesters. 846,700.

General Mills Inc. Synthetic resin compositions. 846,378.

Union Carbide Corporation. Polyepoxide compositions. 846,380.

COUNTY COURT JUDGMENTS

NOTE.—*These Judgments which are supplied from the Registry of County Court Judgments, Lord Chancellor's Department, 3 Dean's Yard, London, S.W.1, are not necessarily for debt, and some may have since been satisfied. They may be for damages or otherwise, they may relate to actions bona fide contested between the parties, or they may be against defendants liable in a representative capacity and not personally; but no distinction is made on the register. A judgment does not imply inability to pay. Judgments are not returned to the Registry if satisfied in Court Books within twenty-one days.*

J. WIGNALL (T/A Tyre House), 78 Tavistock Road, Bedford, Beds. Doncaster, £78 9s. 4d., June 20 1960.

A. AND G. PLASTICS LTD., contractors, Mumby's Yard, High Street, Gosport, Hants. West London, £30 1s. 0d., June 21 1960.

CHARLES THOMAS REVELL, 33 Aughton Road, Southport, Lancs., manufacturer of plastic signs. Southport, £139 5s. 7d. July 12 1960.

WELCO PLASTICS, 12 Duntisbourne Leer, Cirencester, Glos. Cirencester, £34, August 12 1960.

MORRIS, Shawclough Rubber Works, Waterfoot, Lancs. Rawtenstall, £39, August 23 1960.

PRESLAND PLASTICS LTD., 77 Milton Road, West Croydon, Surrey. Leeds, £13, August 22 1960.

L. F. MURLE, 19 Shepherds Bush Road, London, W.6. Shoreditch, £24, August 11 1960.

Crossword

(See page 866 this issue)

ACROSS.—2, Resorcinol. 7, CBE. 8, Treading. 10, Trade. 11, Citadel. 12, Cane. 15, Able. 17, Camping. 18, Enter. 19, Downward. 21, Eel. 22, Wellington.

DOWN.—1, Acetic acid. 2, Remain. 3, Site. 4, Re-edit. 5, Indiana. 6, Own. 9, Golden rule. 13, Empanel. 14, In pain. 16, Batten. 18, Edit. 20, Ore.

NEW COMPANIES

Chas. Cooke (Talgarth) Ltd. (672,623).—October 17. Capital: £5,000 in £1 shares. To carry on the business of electricians, mechanical engineers and manufacturers and workers of and dealers in electrical apparatus and goods, etc. The first directors are: William C. Cooke (chairman) and Eileen G. Cooke, both of London House, Talgarth, Breconshire. Regd. office: Wye Chambers, 24 Castle Street, Hay-on-Wye, Brecknockshire.

Singlehurst Engineering Ltd. (672,775).—October 18. Capital: £10,000 in £1 shares. To carry on the business of buying, selling, manufacturing, repairing, letting on hire, exporting and dealing in all kinds of industrial hoses, rubber or other flexible pipes and fittings, etc. The first directors are: Eric C. Brookes, 9 Summingdale Mount, Sheffield, 11; John T. Holmes, Lamport Grange, Lamport, Northants. Regd. office: Britannia House, Corporation Street, Sheffield, 3.

Polythene Powders (Micro-Mesh) Ltd. (672,654).—October 17. Capital: £100 in £1 shares. To carry on the business of reprocessors and refiners of all types of polythene materials and plastic scrap cellulose acetate polyvinyl chloride and other plastic raw materials and rubber, etc. Director: Mark Gordon, 4 Goodyers Gardens, Hendon, N.W.4. Regd. office: 27 Queen Anne Street, W.1.

Pamol (North Borneo) Ltd. (672,123).—October 10. Capital: £5,000 in £1 shares. To acquire lands, buildings and hereditaments of any tenure, producing palm or rubber or other trees or suitable for the cultivation thereof, etc. The first directors are to be appointed by the subscribers. Solicitors: James Plett, 44 Clarence Road, Teddington, Middlesex.

Warren Rubber Holdings Ltd. (672,071).—October 7. Capital: £100 in 2s. shares. To acquire and hold the whole or any part of the stock in the capitals of Allagar Rubber Plantations Ltd., Cairo (Malay) Rubber Co. Ltd., Eow Seng Rubber Co. Ltd., Escot Rubber Estates Ltd., and Sungei Chinoh Rubber Co. Ltd., etc. The first directors are: James C. Givan, 159 Oakwood Court, W.14; Alexander Douglas, 3 Meadway, Epsom, Surrey; Archibald B. Yuille, 185 Oakwood Court, W.14. Regd. office: 17 St. Helen's Place, E.C.3.

H.C.S. Plastics Ltd. (672,414).—October 13. Capital: £100 in £1 shares. To carry on the business of manufacturers, converters, and processors of and dealers in plastic materials of all kinds, etc. The first directors are to be appointed by the subscribers. Solicitors: Herbert Smith and Co., 62 London Wall, E.C.2.

Symfar Plastics Ltd. (672,493).—October 13. Capital: £6,000 in £1 shares. Solicitors: Wyatt Jeffery and Co., 1 Hyde Park Place, W.2.

R·J·I·P CLASSIFIED ADVERTISEMENTS

APPOINTMENTS VACANT

6d. a word, Minimum 10/- Box 2/-

ASSISTANT TO MANAGING DIRECTOR. Applications are invited for the above post in a well-established, expanding manufacturing company of medium size in the North of England specialising in rubber/ebonite plant lining, industrial roller covering, ebonite fabrications and plastics developments in these fields. Applicants should preferably be between 35 and 45 years of age, have good knowledge of both manufacturing and operating conditions, the latter particularly in relation to the chemical, electro-plating and allied industries, with administrative and managerial experience in a similar company. Commencing salary would be in the medium range and the appointment offers exceptionally good prospects for rapid advancement after a proving period to a person of directoral calibre.—Full details of experience, qualifications, references and salary required, which will be treated in confidence, should be sent to the Managing Director, Box 665. (665)

APPOINTMENTS VACANT

CHIEF ENGINEER

required for Rubber Works, London area, with rubber and plastics machinery experience. Preferably A.M.I.Mech.E., A.M.I.E.E., or equivalent. 35/50 years. This is an executive position calling for powers of leadership and proven administrative ability. Applicants to apply in first instance in own handwriting giving brief outline of experience together with age and qualifications, also salary expected. Pension Scheme.

BOX 664

(664)

LARKHILL RUBBER COMPANY LTD.

until recently the Rubber Division of C. & J. CLARK LIMITED, SHOEMAKERS

wish to appoint

SHIFT FOREMAN

at their new factory at YEOVIL, Somerset

Supervisory and technical experience in the Rubber Industry is essential.

Starting salary will be in the region of £1,000 - £1,250. Three weeks' holiday and good pension scheme.

Applications are invited and should be made to the Senior Personnel Officer, C. & J. Clark Limited, Street, Somerset, marking your envelope 'Private/JT'. (633)

APPOINTMENTS VACANT

(continued)

ENERGETIC rubber technologist/chemist to discuss production problems with UK factories required by old-established company holding agency for leading Continental synthetic rubber producer. L.I.R.I./L.N.C.R.T. standard. Knowledge of French useful.—Write Box RJ.887, c/o Hanway House, Clark's Place, E.C.2. (668)

Rubber technologist for senior position required for development work in the factory. Young graduate with some rubber experience preferred.—Write, phone or call Labour Officer, Richard Klinger Ltd., Klingerit Works, Sidcup, Kent. Footscray 7777. (657)

THE DAYTON RUBBER CO. LTD.

Balgray Street, Dundee

(Subsidiary of Dayco Corporation, Ohio, U.S.A.)

GENERAL FOREMAN

required for Textile Division to be responsible for all aspects of production of synthetic rubber components for textile machinery, to fine limits and tolerances. Applicants must have had at least five years' experience in a production department within the rubber industry.

Applications should be addressed to the Works Manager at the above address.

(658)

DEWEY AND ALMY LIMITED

Elvedon Road, London, N.W.10

have vacancies for

DEVELOPMENT CHEMISTS

A university degree in Chemistry and/or equivalent professional qualification connected with rubber, resins or food technology is essential.

These positions in our research laboratory are concerned with the development and technical service of sealing products in a rapidly expanding field. Opportunities will occur for the successful applicants to take charge of development of specific product groups; leadership qualities and acceptability to customers' senior management are thus important factors in the qualifications for these positions. Age 25-40.

Applications, giving full details of age, qualifications and experience, should be sent in confidence to Personnel Manager. (656)

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(continued)

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